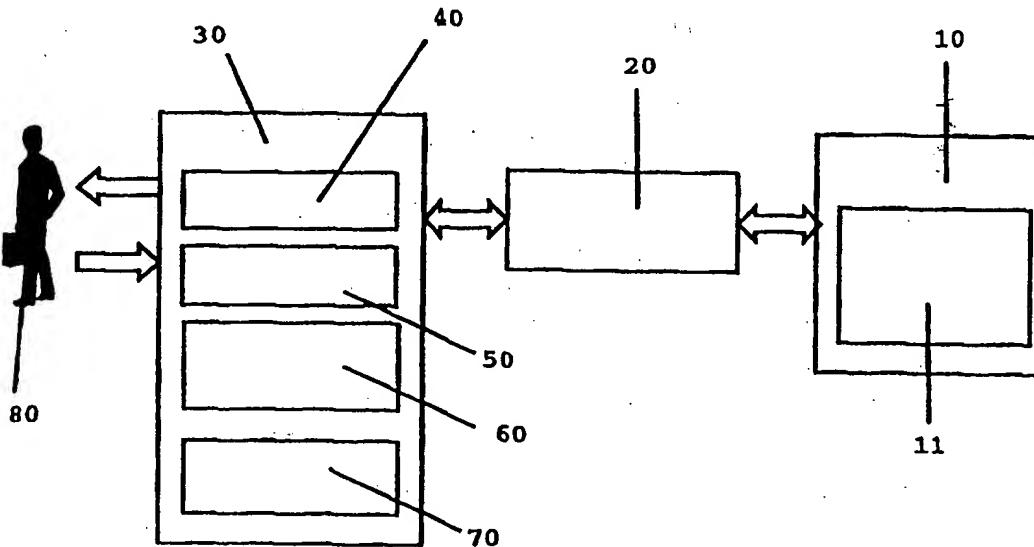




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> :	A1	(11) International Publication Number: WO 99/54836
G06F 17/60		(43) International Publication Date: 28 October 1999 (28.10.99)
<p>(21) International Application Number: PCT/GB99/01031</p> <p>(22) International Filing Date: 21 April 1999 (21.04.99)</p> <p>(30) Priority Data: 98303046.1 21 April 1998 (21.04.98) EP</p> <p>(71) Applicant (for all designated States except US): CAMBRIDGE CONSULTANTS LIMITED [GB/GB]; Science Park, Milton Road, Cambridge CB4 0DW (GB).</p> <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): MARTIN, Sean, Christopher [GB/GB]; 20 Clare Street, Cambridge CB4 3BY (GB). SHARP, David, William, Nathaniel [GB/GB]; 58a Natal Road, Cambridge CB1 3NY (GB).</p> <p>(74) Agent: BURWELL, Jason, Rowell; Cambridge Consultants Ltd., Science Park, Milton Road, Cambridge CB4 0DW (GB).</p>		(81) Designated States: GB, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
<p>Published With international search report.</p>		

(54) Title: DECISION AID



(57) Abstract

An information sorting decision aid which aids a decision-maker through the second stage of decision-making of choosing from a variety of similar products through the use of a graphical preference mechanism together with locally executed recommendation and recommendation.

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1 422 Rec'd PCT/PTO 20 OCT 2000

Decision AidField of the invention

- 5 The present invention relates to technical implementations of methods of aiding decisions when deciding between a plurality of similar products, services or control strategies, in particular to such implementations which use weightings of a number of relevant factors. In particular,  
10 10 the present invention relates to a decision aid for a user engaged in a selection activity using an interaction device connected to the Internet or another communications network.

Background Art

- 15 Consider a situation where a potential customer is faced with selecting the most appropriate product or service from a selection that is great in number.  
20 It can appear to the customer that the products or services are quite similar and their differences are not that apparent, and further, the decision-making process is complicated by the extent of the selection. A customer may typically lack the confidence that any particular product or  
25 service is a good match with their needs, and in consequence such a customer will often not reach a decision to purchase even though very suitable products are offered.

There is therefore a need for a decision aid that assists a  
30 customer in purchasing decisions. Such a decision can produce a short list of products or services which are a good match with the customer's needs together with justification or explanation relating to the selection in the short list. Such a short list can allow the customer to  
35 make the easier final choice from say twenty products or services that appear to the user only to be generally suitable.

'Decision Guide' - a software package that allows users to slide sliders one at a time in order to state how important various features of a holiday are known in the art. This 5 package treats features uniformly in identifying holidays which match the set of criteria that are important to the user.

Rackham's book on 'Making Major Sales' lays out the theory 10 that consumers' behaviour can be modelled by:

- identifying a set of criteria that the consumer considers important in evaluating a product or service;
- 15 - ranking the importance of these selection criteria to the customer;
- identifying leading 'best match' products and services according to a principle based on the match with criteria 20 ranked highly by the consumer in preference to the match with those criteria ranked lowly by the consumer.

However, Rackham does not indicate a mechanism for implementing his theory.

25

Present systems do not allow decision makers to non-linearly weight their decision criteria in order to arrive at an optimum ranking of products/services.

- 30 One accepted account of an overall purchase-decision-making process for a person engaged in the activity of selecting a product or service (hereafter, for simplicity, referred to simply as a product) suggests that there are three individual decision-making steps. The first step concerns 35 the person recognising the need for a product leading to a decision that the person 'wants one of these products'. The second step concerns the person evaluating the options

leading to a decision that the person 'wants a particular product'. The third step concerns the person overcoming doubts that may arise leading to a decision to proceed with and conclude the selection/purchase activity.

5

The limitations of many current techniques of aiding a decision maker are evident when they are compared with this three-step account of the decision-making processes.

- 10 For example, many electronic commerce web sites make good use of graphics and multimedia to engage the user in the desirability of having one of the products being offered, thus helping the user through the first decision-making step. Also, many web sites provide reassurance about the
- 15 final selection/purchase activity such as the security of financial transactions, the return of products, support and warranty, thus helping the user through the third decision-making step. Such web sites thus adequately aid a user with the first and third steps, but do not provide aid for the
- 20 second step.

Many web sites simply present information, and sometimes a considerable amount of information, describing each available product. This is done, presumably, with the

25 expectation that a simple presentation of information about the products on offer will form a sufficient basis for the user to be able to evaluate the options and thus carry through the second step of the decision process. In practice this is not an effective technique and users of such web-

30 sites often do not choose an option (i.e. stay at the first step of the decision-making process) or spontaneously make an ill-informed decision (i.e. miss out the second step of the decision-making process altogether because of information overload).

35

This conclusion is reached by considering a typical situation in electronic commerce. A good retailer is

- generally considered to be one that offers a wide choice to the consumer. The choice offered in a conventional (non-electronic-based) retail environment often comprises a wide range of between ten and thirty or more similar products. A typical retail environment (i.e. a shop) is designed to make the decision process engaging and interesting so that consumers obtain satisfaction from the decision and selection process. However, when using a typical electronic interaction device, such as a personal computer connected to the Internet, it is very difficult (and often uninteresting) for a user to make a selection by browsing detailed large amounts of information about a lengthy succession of individual similar products.
- It is generally possible for a user to make a detailed assessment of selection options from only a very limited range, perhaps as few as three similar products when using such an interaction device. The user's selection process is significantly impaired if there are more than about five similar products, if no assistance is provided for comparing information about the products. This is because it is generally difficult to compare information and so the comparison process becomes a repetitive mental chore that quickly leads to boredom, which in turn leads to distraction thus making it easy for the consumer not to complete the decision-making activity.

The second decision-making step is thus a weak link in the chain of decision-making processes. However, attempts have been made to provide assistance with this decision-making process.

A first example of such an attempt to provide decision-making assistance concerns the presentation of a summary display comprising a synopsis of the many products that are available. A user can select one of these products and request more detailed information regarding that product -

held on a separate web page on a remote server. After examining that information the user returns to the summary page and considers an alternative product. This technique is referred to colloquially as a 'pogo-stick' since it involves 5 the user jumping up and down between a sequence of web pages. It is difficult for the user to compare products because detailed information is shown about only one product at one time and navigation through the information is inhibited by the delays that occur when accessing 10 information from a remote server.

A second example of such an attempt to provide decision-making assistance provides a user with a form with several fields or pull-down menus that are used by the user to 15 convey preference information. The content of such a form is transmitted via the Internet and processed by a remote server. Recommendation logic executes on the remote server and recommendations are then transmitted back to the user. The delay between submitting a completed form and receiving 20 recommendations can often amount to many seconds which is significantly greater than a human user's typical sub-second response time. Such delays induce boredom and allow the user to become distracted. Users might thus typically engage in only two or three alternative queries before being 25 frustrated by the slow response and thus not conclude the decision-making process.

A third example of such an attempt to provide decision-making assistance concerns the improved use of sliders to 30 indicate user preference information instead of making entries in fields in a form or by using pull-down menus. In this example the preference information is transmitted to recommendation logic executing on a remote server, as in the second example thus still leading to a slow response, and 35 the user thus being unwilling to engage in exploring many alternatives.

Summary of the Invention

The invention provides an information sorting system for use  
5 in ranking a plurality of products/services according to the apparent desirability of each product/service to a system user which comprises a memory means which stores information on the plurality of services/products in the form of scores relating to a number of predetermined features of the  
10 products/services, a user interface which allows a user to indicate how important each of the number of predetermined features are to them calculating means for calculating a score for each product/service according to the following formula:

15

$$S_p = f(s_{i,p}, I_i); \quad i \in \{1 \dots N\}; \quad p \in \{1 \dots Q\}$$

wherein

$S_p$  represents the overall score for a particular product  
20  $p$   
 $f(\dots)$  represents 'some function of'  
 $s_{i,p}$  represents the individual score for feature  $i$  of product  $p$  (in the range from  $s_{\min}$  to  $s_{\max}$ )  
 $I_i$  represents the importance of feature  $i$  to the user  
25  $N$  represents the number of predetermined features  
 $Q$  represents the number of products/services

In another aspect, the present invention provides a  
30 technically-implemented decision aid method for aiding the decision-making process of a user for use in conjunction with an interaction device, which is connected to an information network, such as the internet, and a display means of which interaction device displays graphical preference mechanisms for entering, adjusting and displaying preference information and a synopsis of recommended products, wherein the method involves the following steps:

- Product data from a remote server is delivered to the interaction device, which product data contains information concerning products, relevant preference criteria such products, an evaluation of such products with regard to the preference criteria and instructions to the interaction device on how to configure the display means of the interaction device;
- 5
- The user is enabled to enter or adjust preference information using the graphical preference mechanisms;
- 10
- Within the interaction device, recommendation logic executes so that a recommendation of leading products is made substantially immediately following the user entering or adjusting preference information using the graphical preference mechanisms;
- 15
- Within the interaction device, display logic executes so that at least some elements of a synopsis of new recommendations are updated on the display substantially immediately after new recommendations are made by the recommendation logic;
- 20
- The user is enabled to indicate one of the recommended products using a pointing or similar selection device, such as a mouse.
- 25

In one preferred embodiment, the graphical preference mechanisms consist of graphical slider mechanisms.

In another preferred embodiment, the display means also displays detailed information about one of the recommended products.

35

In another preferred embodiment, the display means also displays a graphical pre-select mechanism for pre-selecting

a subset of the available products from which recommendations are to be made.

The present invention has at least the following advantages  
5 over prior art decision aids:

- The user may quickly explore the consequences of many different combinations of preferences while the display is updated with recommendations without apparent delay.

10

- The simultaneous display of graphical preference mechanisms, the synopsis of recommendations (and, in one preferred embodiment, detailed information about one of the recommended products) together provide the user with a visual context for the overall decision-making process. This visual context provides short term memory for the user thus assisting the decision-making process by reminding the user of their preferences, the recommended products (and, in one embodiment, the details concerning one of these products). This removes a mental chore that makes unaided comparison between similar products difficult. This visual context would be absent when the user sequentially has to navigate a sequence of web pages.

15

The present invention is unique because it provides highly interactive assistance for a user engaged in a selection task in a way that matches the psychological decision making processes of the user, and also while obtaining data about products from a remote server.

20

The invention provides a system which non-linearly weights various features and provides a fast, efficient manner for ranking a plurality of similar products/services.

25

The invention also provides a powerful means for translating a user's apparent preferences into a decision which may be

used in controlling a machine based on a machine operator's preferences.

Further objectives and advantages of the invention will 5 become apparent from a consideration of the ensuing description.

**Brief Description of Drawings**

10

Figure 1: A schematic diagram showing a typical embodiment according to the invention implemented for a simple scenario involving a user choosing from amongst a plurality of mobile phones.

15

Figure 2: A schematic block diagram describing the main system components.

20

Figure 3: A schematic block diagram describing the principal interaction components.

Figure 4: A schematic block diagram describing the components of the interaction device.

25

**Detailed description of the invention**

The present invention provides a system which provides a user with a method of using Rackham's theories without 30 having to understand them. The invention combines:

- a technique for interacting with the user that allows the user to indicate the importance of criteria for selecting a product or service, and in so doing allows the ranking 35 of the criteria to be inferred;

10

- an algorithm for scoring which places a greater weight on the match of candidate products or services for criteria ranked highly by the user and which places a lesser weight on the match of candidate products or services for
- 5 criteria ranked lowly by the user;
- a technique for ranking the scores of candidate products or services and displaying the leading products or services deduced to be the most appropriate for the user.

10

The present invention involves the novel combination of a user interface comprising several sliders with Rackham's hypothesis and with a novel weighted matching algorithm to rank products or services being chosen amongst. Each product

15 or service is given a score based on how well its feature strengths match the needs of a user of the system of the invention as expressed by the positions of the sliders.

In general, the novel algorithm may be represented as

20 follows:

$$S_p = f(s_{i,p}, I_i); \quad i \in \{1 \dots N\}; \quad p \in \{1 \dots Q\}$$

wherein

- 25  $S_p$  represents the overall score for product  $p$   
 $f(\dots)$  represents 'some function of'  
 $s_{i,p}$  represents the score for feature  $I$  of product  $p$  (in the range from  $s_{\min}$  to  $s_{\max}$ )  
 $I_i$  represents the importance of feature  $I$  to the user  
30  $N$  represents the number of features  
 $Q$  represents the number of products or services

A simple implementable example of the general algorithm given above would be:

35

$$S_p = \sum_{i=1 \text{ to } N} (s_{i,p} \times I_i)$$

The system displays a score bar indicating how well a product or service matches the user's criteria.

5 The score value may be normalised relative to the maximum score a perfect product or service could obtain. Using the simple example given above, this would mean:

$$\text{Length of score bar} = \frac{\sum_{i=1 \text{ to } N} (s_{i,p} \times I_i)}{\sum_{i=1 \text{ to } N} (s_{\max} \times I_i)} = \frac{\sum_{i=1 \text{ to } N} (s_{i,p} \times I_i)}{s_{\max} \times \sum_{i=1 \text{ to } N} (I_i)}$$

10

In a preferred embodiment, the scoring algorithm is adjusted to give the same subjective ranking that would be chosen by a salesperson who is an expert at selling the range of products or services. This is achieved either by tuning the 15 scoring algorithm according to heuristics or using neural network techniques to score the product match.

When used in a control system, the information sorting system of the current invention allows the control system to 20 make qualitative choices between the various control strategies which the control system has available to it based on a system operator's indicated preferences - without a need for the system operator to do more than indicate these preferences. No prior art information sorting system 25 allowed such a simple operator interaction with a controlled system.

Referring to Figure 2, a remote server (10) is a computing 30 device that holds source reference data and program logic (11) for the electronic selection aid. The communications medium (20) connects the remote server (10) to the interaction device (30). The source reference data and program logic (11) is downloaded via the communications 35 medium (20) to the interaction device (30) where it is held as reference data and program logic (60). The interaction device (30) comprises a display (40) and an input device

(50). The user (80) interacts with the interaction device (30) by means of the display (40) which conveys information from the interaction device (30) to the user, and by means of the input device (50) which conveys information from the 5 user to the interaction device.

Referring to Figure 3, the interaction device (30) comprises four principal components each comprising both a display and an input device, as follows:

10

The pre-selection component (41) and its associated input device (51) are optional, and may be used to select a subset from the total number of products available. This may include the use of radio buttons to select products with 15 particular attributes, for example, selecting only portable products.

The preference display (42) indicates to the user the current preference settings, which are entered using the 20 input device (52).

The recommendations display (43) indicates a synopsis of the recommendations that are a good match with the preference settings. The associated input device (53) can be used to 25 select a particular product as being chosen or requesting more detailed information about a particular product.

The detailed display (44) presents detailed information about one of the recommended products. The associated input 30 device (54) can be used to select a particular product as being chosen.

Referring to figure 4, display reference data (61) contains information controlling the layout of the displays on the 35 interaction device (30). Product reference data (62) contains scores for each product with respect to each preference criterion. Algorithm selection data (63) contains

information controlling the behaviour of the recommendation logic (66). The group of items (61), (62) and (63) thus provide the reference data, which is part of (60), and which is used by other components of the interaction device. The 5 remainder of (60) comprises the program logic modules: the preference control logic (65), the recommendation logic (66), the recommendation display control logic (67) and the detailed display control logic (68).

- 10 The pre-selection control logic (64) takes display reference data (61) and uses it to format the pre-selection display (41) and the associated input device (51). The pre-selection control logic indicates to the recommendation logic (66) whether recommendations are to be made from a subset of the 15 available products.

The preference control logic (65) takes display reference data (61) and uses it to format the preference display (42). Preference control logic (65) also takes information from 20 the associated input device (52) regarding preference information entered by the user and updates the preference display (42). It passes the preference information (71) to the recommendation logic (66).

- 25 The recommendation logic (66) uses algorithm selection data 63 and product reference data (62) to process preference information (71) and produces product recommendations (72). Several different algorithms may be used within the recommendation logic (66) where these may be as described 30 above or based on a least squares best match algorithm, or other matching algorithms.

Product recommendations (72) are passed to the recommendation display control logic (67). Recommendation 35 display control logic (67) uses display reference data (61) to format the recommendation display (43) and display the recommendations contained within product recommendations

(72). Recommendation display control logic (67) also responds to information from the associated input device (53) regarding (a) the selection of a particular product to identify a selected product (73), and (b) whether the user 5 has chosen a particular product.

- A selected product (73) is passed to the detailed display control logic (68). Detailed display control logic (68) uses this information and the display reference data (61) to 10 format the detailed display (44). Detailed display control logic (68) also responds to information from the associated input device (54) if the user has chosen a particular product.
- 15 When the user chooses a product using input devices (53) or (54) the control logic modules (67) or (68) will send a reporting signal reporting the chosen product (82) or (83) to the remote server (10) via the communications medium (20) indicating that a choice has been made.

20 Under certain conditions the preference control logic (65) will also send a reporting signal (81) to the remote server (10) via the communications medium (20) indicating the preferences entered by the user. This can occur, for 25 example, when the user chooses a particular product, but may also occur when a user requests more information on a particular product to be displayed on the detailed display (44). The reported preference information may subsequently be used for market research purposes.

30 The system of the present invention can allow the names, and other textual descriptions such as price, describing the recommended products to be displayed very quickly. It may be necessary for pictures of the recommended products to be 35 requested from the remote server and displayed when they become available.

The display logic can present more detail about the indicated product on the display of the interaction device while the display also shows slider settings and the synopsis of recommended products. The user may so indicate 5 simply by pointing, or hovering, the pointing device over the portion of the display where a synopsis of one recommended product is shown.

A limited number of leading recommendations may be displayed 10 (typically three, as experience shows that a user can make a detailed comparison between three options). This aspect results in two advantages. Firstly, the user can examine detailed information about each option and re-examine it without apparent delay. This eases the task of making 15 comparisons. Secondly, it is better to display several recommendations rather than a single recommendation as most users obtain satisfaction or enjoyment from a decision making process. If only one recommendation were made then this would deprive the user of the satisfaction or enjoyment 20 that would have been obtained from a decision making process.

The user may request more information about a recommended product simply by pointing, or hovering, the pointing device 25 over the portion of the display where a synopsis of the recommended product is shown. This allows the display to be updated rapidly when the user traverses the pointing device over a succession of synopses of recommended products, and the rapid update also eases the comparison of similar 30 products.

**Claims**

1. An information sorting system for use in ranking a plurality of products/services according to the  
5 apparent desirability of each product/service to a system user which comprises:

10 - a memory means which stores information on the plurality of services/products in the form of scores relating to a number of predetermined features of the products/services;

15 - a user interface which allows a user to indicate how important each of the number of predetermined features are to them

- calculating means for calculating a score for each product/service according to the following formula:

20  $S_p = f(s_{i,p}, I_i); \quad i \in \{1 \dots N\}; \quad p \in \{1 \dots Q\}$

wherein

$S_p$  represents the overall score for a particular product  $p$

25  $f(\dots)$  represents 'a function of'

$s_{i,p}$  represents the individual score for feature  $i$  of product  $p$  (in the range from  $s_{\min}$  to  $s_{\max}$ )

30  $I_i$  represents the importance of feature  $i$  to the user

$N$  represents the number of predetermined features

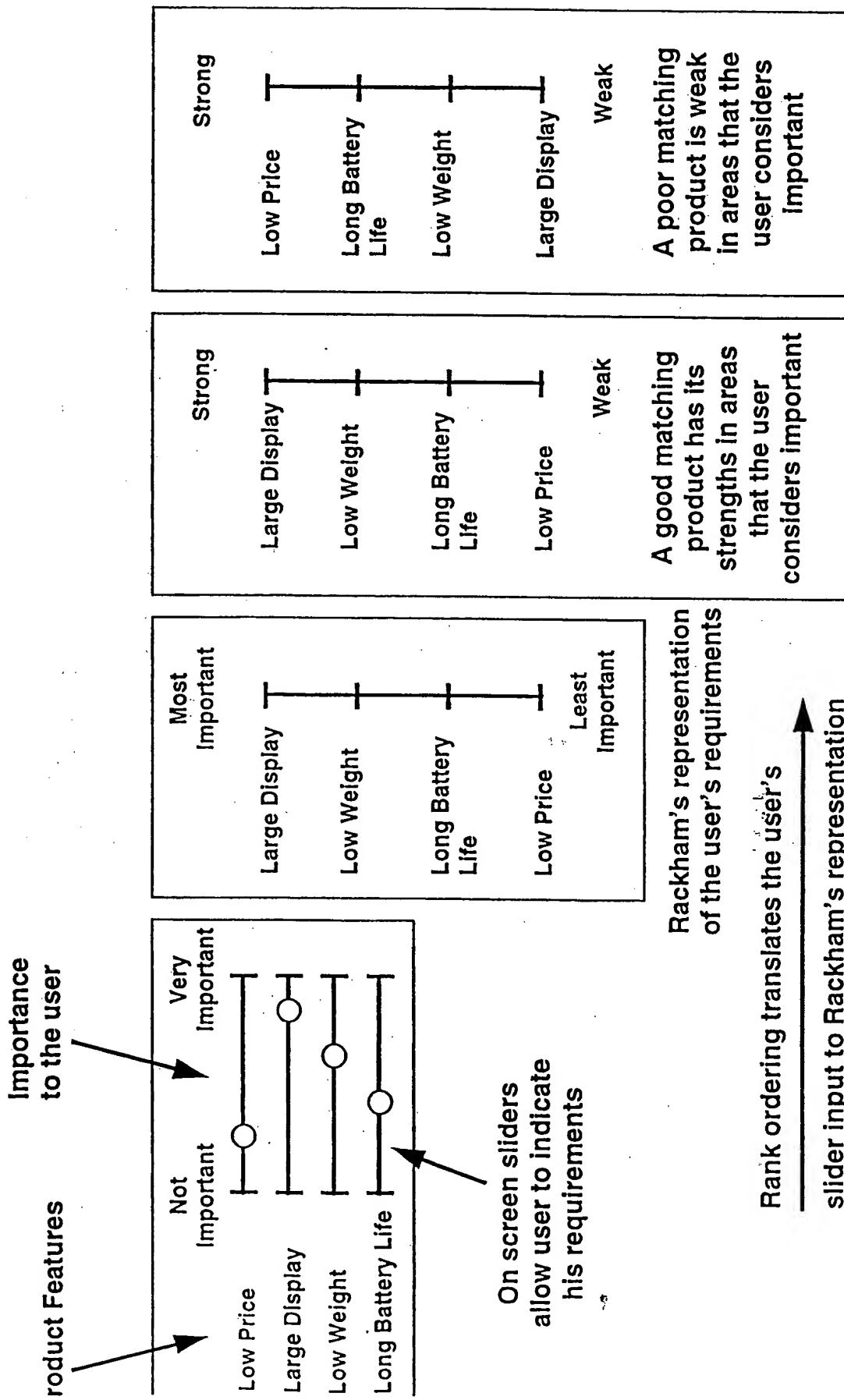
35  $Q$  represents the number of products/services

2. An information sorting system according to claim 1 which further comprises display means for displaying a ranked list of products/services to the user.

3. An information sorting system according to claim 1 which is used as part of a control system in which the product/service with the highest score is used as a basis for automatically deciding which control strategy 5 from a plurality of available control strategies is to be executed by the control system.
4. A technically-implemented decision aid method for aiding the decision-making process of a user for use in conjunction with an interaction device, which is connected to an information network, such as the internet, and a display means of which interaction 10 device displays graphical preference mechanisms for entering, adjusting and displaying preference information and a synopsis of recommended products, 15 wherein the method involves the following steps:
- product data from a remote server is delivered to the interaction device, which product data contains 20 information concerning products, relevant preference criteria such products, an evaluation of such products with regard to the preference criteria and instructions to the interaction device on how to configure the display means of the interaction device;
  - the user is enabled to enter or adjust preference 25 information using the graphical preference mechanisms;
  - within the interaction device, recommendation logic 30 executes so that a recommendation of leading products is made substantially immediately following the user entering or adjusting preference information using the graphical preference 35 mechanisms;

- within the interaction device, display logic executes so that at least some elements of a synopsis of new recommendations are updated on the display substantially immediately after new recommendations are made by the recommendation logic;
- 5
- the user is enabled to indicate one of the recommended products using a pointing or similar selection device, such as a mouse.
- 10
5. A technically implemented decision aid method according to claim 4 in which the graphical preference mechanisms consist of graphical slider mechanisms.
- 15
6. A technically implemented decision aid method according to either of claims 4 or 5 in which the display means also displays detailed information about one of the recommended products.
- 20
7. A technically implemented decision aid method according to any of claims 4 to 6 in which the display means also displays a graphical pre-select mechanism for pre-selecting a subset of the available products from which recommendations are to be made.
- 25

1/3



2/3

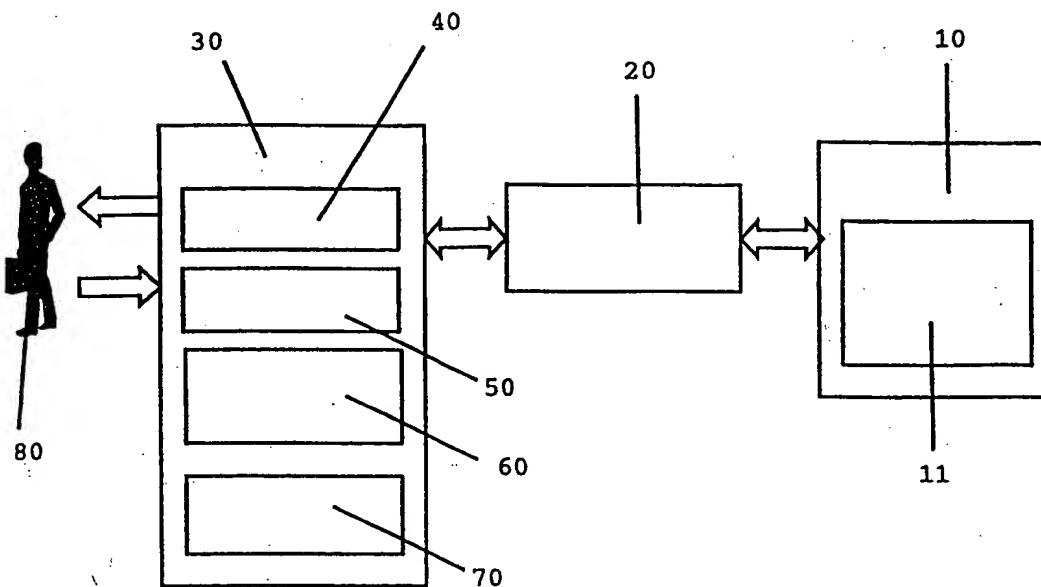
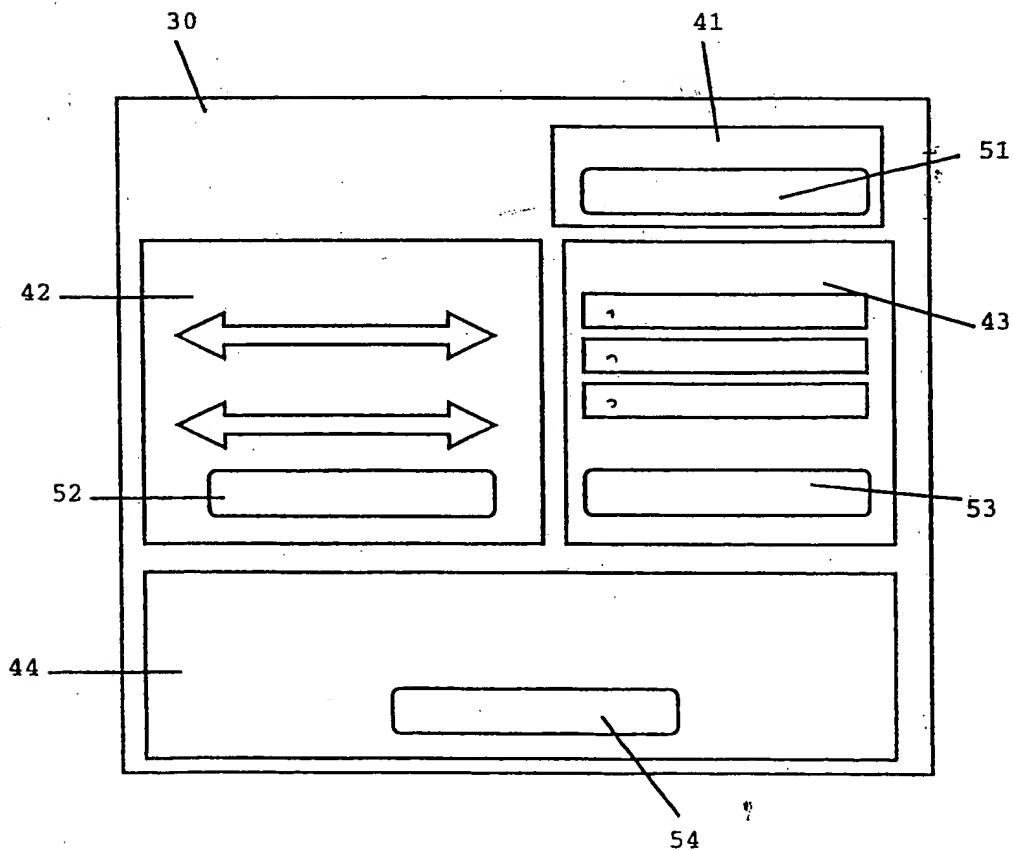


Figure 2



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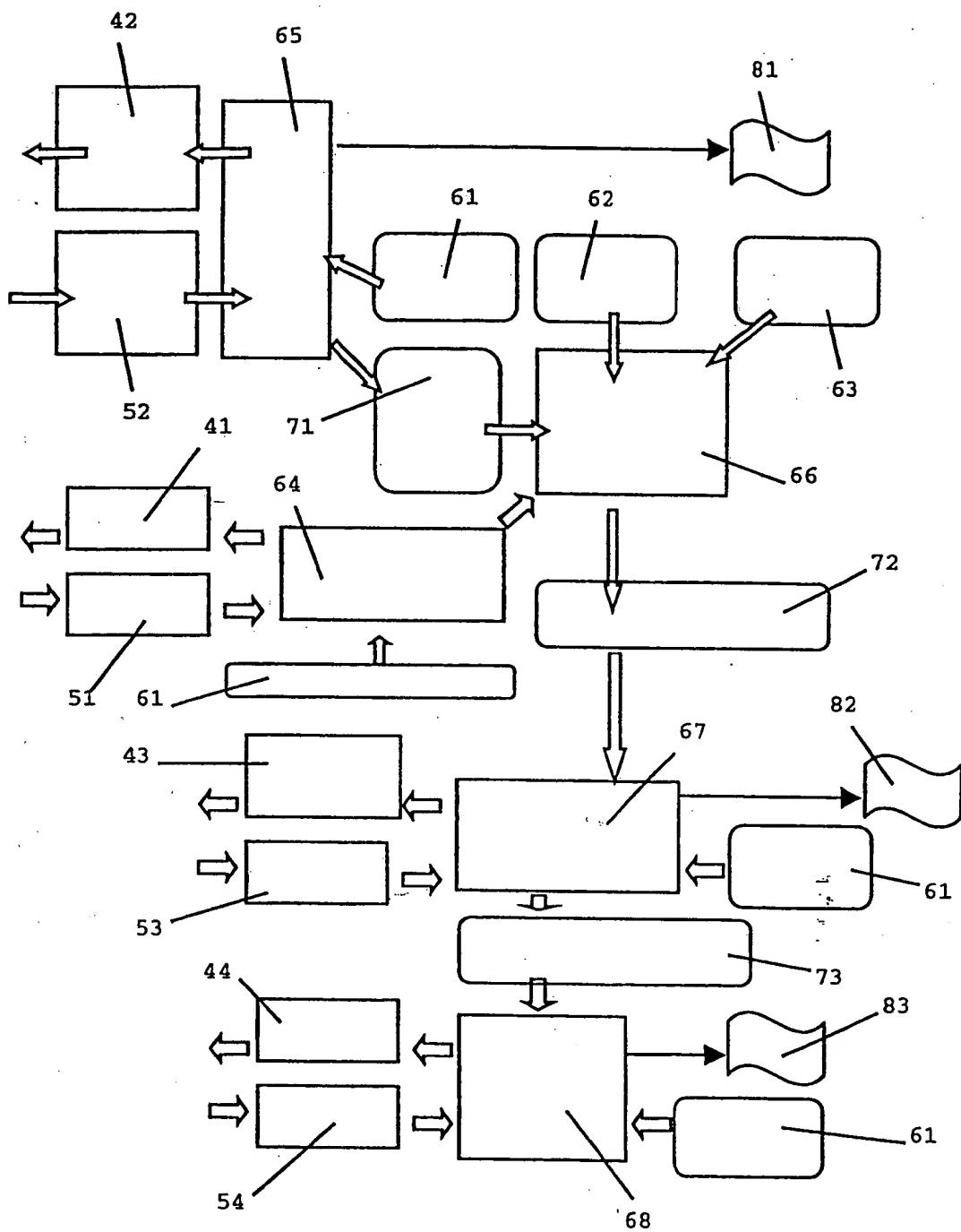


Figure 4

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/01031

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 6 G06F17/60

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 717 865 A (STRATMANN WILLIAM C) 10 February 1998 (1998-02-10) column 2, line 34 - column 5, line 29 figure 7 ---	1,4,5,7
Y	column 2, line 34 - column 5, line 29 figure 7 ---	6
X	WO 95 29452 A (APPLE COMPUTER ;ROSE DANIEL E (US); BORNSTEIN JEREMY J (US); TIENE) 2 November 1995 (1995-11-02) page 3, line 3 - line 28 page 7, line 10 - line 23 figures 3,7 ---	1,2
Y	page 3, line 3 - line 28 page 7, line 10 - line 23 figures 3,7 ---	6
	-/-	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
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PCT/GB 99/01031

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	AHLBERG C ET AL: "DYNAMIC QUERIES FOR INFORMATION EXPLORATION: AN IMPLEMENTATION AND EVALUATION" STRIKING A BALANCE, MONTEREY, MAY 3 - 7, 1992, 3 May 1992 (1992-05-03), pages 619-626, XP000426842 BAUERSFELD P; BENNETT J; LYNCH G page 620, column 1, line 6 - column 2, line 20 figures 1,2 ---	1-7
A	KROLL J: "FINDEN STATT SUCHEN. MULTIMEDIA-DATENBANK FUR ELEKTRONISCHE BAUTEILE: DER KATALOG AUF CD FEIERT PREMIERE" ELEKTRONIK, vol. 43, no. 20, 4 October 1994 (1994-10-04), pages 92-94, 96 - 98, XP000445340 ISSN: 0013-5658 page 94, column 2, line 24 - page 95, column 1, line 10 figure 6 ---	1-7
A	WO 97 49055 A (VERIFONE INC ; KRAMER GLENN A (US); ROWNEY KEVIN T B (US)) 24 December 1997 (1997-12-24) page 10, line 4 - page 11, line 7 ----	1-7

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International Application No

PCT/GB 99/01031

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US 5717865	A 10-02-1998	NONE		
WO 9529452	A 02-11-1995	US 5724567 A 03-03-1998	AU 2363895 A 16-11-1995	
WO 9749055	A 24-12-1997	AU 3492697 A 07-01-1998		

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>X042/P491</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 99/ 01031</b>	International filing date (day/month/year) <b>21/04/1999</b>	(Earliest) Priority Date (day/month/year) <b>21/04/1998</b>
Applicant <b>CAMBRIDGE CONSULTANTS LIMITED et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
  - contained in the international application in written form.
  - filed together with the international application in computer readable form.
  - furnished subsequently to this Authority in written form.
  - furnished subsequently to this Authority in computer readable form.
  - the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  - the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2.  Certain claims were found unsearchable (See Box I).

3.  Unity of invention is lacking (see Box II).

4. With regard to the title,

- the text is approved as submitted by the applicant.
- the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- the text is approved as submitted by the applicant.
- the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

- as suggested by the applicant.
- because the applicant failed to suggest a figure.
- because this figure better characterizes the invention.

2

None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/01031

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G06F17/60

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 717 865 A (STRATMANN WILLIAM C) 10 February 1998 (1998-02-10) column 2, line 34 - column 5, line 29 figure 7 ----	1,4,5,7
Y		6
X	WO 95 29452 A (APPLE COMPUTER ;ROSE DANIEL E (US); BORNSTEIN JEREMY J (US); TIENE) 2 November 1995 (1995-11-02) page 3, line 3 - line 28 page 7, line 10 - line 23 figures 3,7 ----	1,2
Y		6
		-/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

23 July 1999

Date of mailing of the international search report

02/08/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Pedersen, N

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/01031

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>AHLBERG C ET AL: "DYNAMIC QUERIES FOR INFORMATION EXPLORATION: AN IMPLEMENTATION AND EVALUATION"          STRIKING A BALANCE, MONTEREY, MAY 3 - 7, 1992, 3 May 1992 (1992-05-03), pages 619-626, XP000426842          BAUERSFELD P; BENNETT J; LYNCH G          page 620, column 1, line 6 - column 2,          line 20          figures 1,2</p> <p>---</p>	1-7
A	<p>KROLL J: "FINDEN STATT SUCHEN.          MULTIMEDIA-DATENBANK FUR ELEKTRONISCHE BAUTEILE: DER KATALOG AUF CD FEIERT PREMIERE"          ELEKTRONIK,          vol. 43, no. 20,          4 October 1994 (1994-10-04), pages 92-94,          96 - 98, XP000445340          ISSN: 0013-5658          page 94, column 2, line 24 - page 95,          column 1, line 10          figure 6</p> <p>---</p>	1-7
A	<p>WO 97 49055 A (VERIFONE INC ; KRAMER GLENN A (US); ROWNEY KEVIN T B (US))          24 December 1997 (1997-12-24)          page 10, line 4 - page 11, line 7</p> <p>-----</p>	1-7

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/01031

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US 5717865	A 10-02-1998	NONE		
WO 9529452	A 02-11-1995	US 5724567 A 03-03-1998	AU 2363895 A 16-11-1995	
WO 9749055	A 24-12-1997	AU 3492697 A 07-01-1998		

The demand must be filed directly with the competent International Preliminary Examining Authority or two or more Authorities are competent, with the one chosen by the applicant. The name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ EP

# PCT

## CHAPTER II

### DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference X042/P491
International application No.  PCT/GB99/01031	International filing date (day/month/year)  21/04/99	(Earliest) Priority date (day/month/year)  21/04/98
Title of invention  Decision Aid		
Box No. II APPLICANT(S)		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  Cambridge Consultants Limited Science Park Milton Road Cambridge CB4 0DW United Kingdom		Telephone No.: 00 44 1223 420024  Facsimile No.: 00 44 1223 423373  Teleprinter No.:
State (that is, country) of nationality:  GB	State (that is, country) of residence:  GB	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  Martin; Sean Christopher 20 Clare Street Cambridge CB4 3BY United Kingdom		
State (that is, country) of nationality:  GB	State (that is, country) of residence:  GB	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  Sharp; David William Nathaniel 58a Natal Road Cambridge CB1 3NY United Kingdom		
State (that is, country) of nationality:  GB	State (that is, country) of residence:  GB	
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.		

**Box No. III ADDRESS FOR CORRESPONDENCE**

The following person is  agent  common representative

and  has been appointed earlier and represents the applicant(s) also for international preliminary examination.

is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: (*Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.*)

Burwell; Jason Rowell  
Cambridge Consultants Limited  
Science Park  
Milton Road  
Cambridge CB4 0DW  
United Kingdom

Telephone No.:

00 44 1223 392415

Facsimile No.:

00 44 1223 423373

Teleprinter No.:

Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:\***

1. The applicant wishes the international preliminary examination to start on the basis of:

the international application as originally filed

the description  as originally filed

as amended under Article 34

the claims  as originally filed

as amended under Article 19 (together with any accompanying statement)

as amended under Article 34

the drawings  as originally filed

as amended under Article 34

2.  The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3.  The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). (*This check-box may be marked only where the time limit under Article 19 has not yet expired.*)

- \* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English .....

which is the language in which the international application was filed.

which is the language of a translation furnished for the purposes of international search.

which is the language of publication of the international application.

which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

**Box No. V ELECTION OF STATES**

The applicant hereby elects all eligible States (*that is, all States which have been designated and which are bound by Chapter II of the PCT*)

excluding the following States which the applicant wishes not to elect:

**Box No. VI CHECK LIST**

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- |                                                                          |   |        |
|--------------------------------------------------------------------------|---|--------|
| 1. translation of international application                              | : | sheets |
| 2. amendments under Article 34                                           | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19  | : | sheets |
| 5. letter                                                                | : | sheets |
| 6. other (specify)                                                       | : | sheets |

For International Preliminary Examining Authority use only  
received      not received

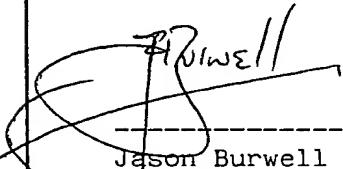
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- |                                                                                          |                                                                                                     |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1. <input checked="" type="checkbox"/> fee calculation sheet                             | 4. <input type="checkbox"/> statement explaining lack of signature                                  |
| 2. <input type="checkbox"/> separate signed power of attorney                            | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (specify):                                                        |

**Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE**

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).



-----  
Jason Burwell  
IP Manager  
Cambridge Consultants Ltd.

Sean Martin  
Inventor/Applicant

David Sharp  
Inventor/Applicant

- For International Preliminary Examining Authority use only
1. Date of actual receipt of DEMAND:
  2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):
  3.  The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.  The applicant has been informed accordingly.
  4.  The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.
  5.  Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

## PCT

## FEE CALCULATION SHEET

## Annex to the Demand for international preliminary examination

International application No.	PCT/GB99/01031	For International Preliminary Examining Authority use only									
Applicant's or agent's file reference	X042/P491	Date stamp of the IPEA									
<p><b>Applicant</b> Cambridge Consultants Limited</p>											
<p><b>Calculation of prescribed fees</b></p> <table border="1"> <tr> <td>1. Preliminary examination fee .....</td> <td>£1,035.00</td> <td>P</td> </tr> <tr> <td>2. Handling fee (<i>Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.</i>) .....</td> <td>£100.00</td> <td>H</td> </tr> <tr> <td>3. Total of prescribed fees <i>Add the amounts entered at P and H and enter total in the TOTAL box.....</i></td> <td>£1,135.00</td> <td>TOTAL</td> </tr> </table>			1. Preliminary examination fee .....	£1,035.00	P	2. Handling fee ( <i>Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.</i> ) .....	£100.00	H	3. Total of prescribed fees <i>Add the amounts entered at P and H and enter total in the TOTAL box.....</i>	£1,135.00	TOTAL
1. Preliminary examination fee .....	£1,035.00	P									
2. Handling fee ( <i>Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.</i> ) .....	£100.00	H									
3. Total of prescribed fees <i>Add the amounts entered at P and H and enter total in the TOTAL box.....</i>	£1,135.00	TOTAL									
<p><b>Mode of Payment</b></p> <table> <tr> <td><input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)</td> <td><input type="checkbox"/> cash</td> </tr> <tr> <td><input checked="" type="checkbox"/> cheque</td> <td><input type="checkbox"/> revenue stamps</td> </tr> <tr> <td><input type="checkbox"/> postal money order</td> <td><input type="checkbox"/> coupons</td> </tr> <tr> <td><input type="checkbox"/> bank draft</td> <td><input type="checkbox"/> other (<i>specify</i>): _____</td> </tr> </table>			<input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> cash	<input checked="" type="checkbox"/> cheque	<input type="checkbox"/> revenue stamps	<input type="checkbox"/> postal money order	<input type="checkbox"/> coupons	<input type="checkbox"/> bank draft	<input type="checkbox"/> other ( <i>specify</i> ): _____	
<input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> cash										
<input checked="" type="checkbox"/> cheque	<input type="checkbox"/> revenue stamps										
<input type="checkbox"/> postal money order	<input type="checkbox"/> coupons										
<input type="checkbox"/> bank draft	<input type="checkbox"/> other ( <i>specify</i> ): _____										

**Deposit Account Authorization** (*this mode of payment may not be available at all IPEAs*)

The IPEA/  is hereby authorized to charge the total fees indicated above to my deposit account.

(*this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit*) is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.

Deposit Account Number

Date (day/month/year)

Signature

**PATENT COOPERATION TREATY**

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

**PCT**

To:

BURWELL, Jason, Rowell  
Cambridge Consultants Ltd.  
Science Park  
Milton Road  
Cambridge CB4 0DW  
GRANDE BRETAGNE

**NOTIFICATION OF RECEIPT  
OF DEMAND BY COMPETENT INTERNATIONAL  
PRELIMINARY EXAMINING AUTHORITY**

(PCT Rules 59.3(e) and 61.1(b), first sentence  
and Administrative Instructions, Section 601(a))

Date of mailing  
(day/month/year)

- 2. 12. 99

Applicant's or agent's file reference  
**X042/P491**

**IMPORTANT NOTIFICATION**

International application No.	International filing date (day/month/year)	Priority date (day/month/year)
<b>PCT/ GB 99/ 01031</b>	<b>21/04/1999</b>	<b>21/04/1998</b>

Applicant

**CAMBRIDGE CONSULTANTS LIMITED et al.**

1. The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

**22/11/1999**

2. This date of receipt is:

- the actual date of receipt of the demand by this Authority (Rule 61.1(b)).  
 the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).  
 the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3.  **ATTENTION:** That date of receipt is AFTER the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide*, Volume II.

- (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/



European Patent Office  
D-80298 Munich  
Tel. (+ 49-89) 2399-0, Tx: 523656 epmu d  
Fax: (+ 49-89) 2399-4465

Authorized officer

**RIXNER E K**

Tel. (+ 49-89) 2399-8557



## TENT COOPERATION TR

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BURWELL, Jason, Rowell  
Cambridge Consultants Ltd.  
Science Park  
Milton Road  
Cambridge CB4 0DW  
GRANDE BRETAGNE

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year)	11.02.2000
-------------------------------------	------------

Applicant's or agent's file reference <b>X042/P491</b>	<b>REPLY DUE</b>	<b>within 3 month(s)</b> from the above date of mailing
-----------------------------------------------------------	------------------	------------------------------------------------------------

International application No. <b>PCT/GB99/01031</b>	International filing date (day/month/year) <b>21/04/1999</b>	Priority date (day/month/year) <b>21/04/1998</b>
--------------------------------------------------------	-----------------------------------------------------------------	-----------------------------------------------------

International Patent Classification (IPC) or both national classification and IPC <b>G06F17/60</b>
-------------------------------------------------------------------------------------------------------

Applicant <b>CAMBRIDGE CONSULTANTS LIMITED et al.</b>
----------------------------------------------------------

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I     Basis of the opinion
- II    Priority
- III    Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV    Lack of unity of invention
- V    Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI    Certain document cited
- VII    Certain defects in the international application
- VIII    Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

**When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also:** For an additional opportunity to submit amendments, see Rule 66.4. For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis. For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: **21/08/2000**.

Name and mailing address of the international preliminary examining authority:  
European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Glaser, N

Formalities officer (incl. extension of time limits)  
Taylor, K  
Telephone No. +49 89 2399 8557



**I. Basis of the opinion**

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

**Description, pages:**

1-15                  as originally filed

**Claims, No.:**

1-7                  as originally filed

**Drawings, sheets:**

1-3                  as originally filed

2. The amendments have resulted in the cancellation of:

- the description,      pages:  
 the claims,           Nos.:  
 the drawings,        sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

- the entire international application,  
 claims Nos. 2-7,

because:

- the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

- the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 2-7 are so unclear that no meaningful opinion could be formed (*specify*):  
**see separate sheet**
- the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- no international search report has been established for the said claims Nos. .

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims 1 (no)
Inventive step (IS)	Claims 1 (no)
Industrial applicability (IA)	Claims 1 (yes)

2. Citations and explanations

**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

sThe examination is being carried out on the application documents as **originally filed**.

Reference is made to the following documents :

- D1: US-A-5 717 865 (STRATMANN WILLIAM C) 10 February 1998 (1998-02-10)
- D2: WO 95 29452 A (APPLE COMPUTER ;ROSE DANIEL E (US); BORNSTEIN JEREMY J (US); TIENE) 2 November 1995 (1995-11-02)
- D3: AHLBERG C ET AL: 'DYNAMIC QUERIES FOR INFORMATION EXPLORATION: AN IMPLEMENTATION AND EVALUATION' STRIKING A BALANCE, MONTEREY, MAY 3 - 7, 1992,3 May 1992 (1992-05-03), pages 619-626, XP000426842 BAUERSFELD P; BENNETT J; LYNCH G
- D4: KROLL J: 'FINDEN STATT SUCHEN. MULTIMEDIA-DATENBANK FUR ELEKTRONISCHE BAUTEILE: DER KATALOG AUF CD FEIERT PREMIERE' ELEKTRONIK, vol. 43, no. 20, 4 October 1994 (1994-10-04), pages 92-94, 96 - 98, XP000445340 ISSN: 0013-5658

### Section III (No opinion)

1. **Claim 2** defines the subject matter at the hand of features which have not been properly introduced (Rule 6.3 PCT). The feature "a ranked list of products/services" has not been defined neither in claim 2 nor in claim 1, for which claim 2 is dependent.
2. **Claim 3** does not fulfill the requirements of Art. 6 PCT in that the matter for which protection is sought is not clearly defined. Claim 3 defines the invention by reference to features of the use to which the information sorting system is to be put a lack of clarity results (PCT/GL/III-4.8).

Moreover, dependent claim 3 is supposed to define a specific form of the claimed invention, which is defined in claim 1 (Rule 13.1 PCT). However, claim 3 is worded such that it defines features of a control system to which the information sorting system is put into some relation. A further lack of clarity arises.

3. No opinion is given to **claims 4-7** as there is a severe lack of conciseness (Art. 6 PCT) between the two independent claims 1 and 4. It is held that there is no correspondence of the essential features of the two claims (see Section VII/VIII); moreover, claim 4 as such lacks clarity due to unclear features. As a consequence, there is doubt about the subject matter for which protection is sought and no

examination of claims 4-7 can be given.

## Section V (Novelty, Inventive Step)

- 1.1 Having regard to the lack of clarity of **claim 1** (Section VII/VIII), claim 1 is interpreted to define an information sorting system, comprising a memory means which stores information on a plurality of products in the form of scores relating to a number of predetermined features of said products, a user-interface which allows a user to indicate somehow some property of each of said predetermined features, and a means for calculating an [overall] score of said product from the [individual] score of each predetermined feature and said property given by the user for each of said predetermined features.
- 1.2 Such a claim is not novel over D1 which discloses an information sorting system comprising the features recited in **claim 1**. D1 (D1: column 2, lines 35-63) discloses a list of products/services ("plurality of alternatives") for which a list of predetermined features is given ("decision components"), and for each of said components a score is associated by the user reflecting the importance to the user's decision marking. An overall score is determined from the importance and from additional scores, i.e. expected satisfaction and/or reliability, which are associated with each feature.

As a consequence, the subject matter of **claim 1 as presently formulated** is therefore not novel over D1 in the sense of Art. 33(2) PCT.

- 1.3 For sake of completeness, it is added that the D1 system comprises a "ranking function" (D1: column 4, lines 50ff.) allowing a user to determine the choice item with the greatest score. The applicant is further referred to Figure 10: step 68, in particular, illustrates the ranking of decision components and a letter is produced for the user as to where he may wish to seek additional information.
2. For sake of an advanced examination, the applicant is informed that **D1** (see paragraph 1) would be considered as novelty destroying over a clarified claim 4. In addition, the following comments are made :
  - 2.1 The feature of using "graphical slider mechanisms" (claim 5) is anticipated by D3 (D3:

Figure 1, page 620, third paragraph, and Section 2.3.1). The advantages of sliders are known to a skilled person in the art, i.e. limiting the input of a user to a predetermined set of values.

- 2.2 The feature of "displaying detailed information" (claim 6) is known from D4 (D4: page 97, second paragraph and Figure 8).
- 2.3 The feature of "a pre-selecting mechanism for preselecting a subset .." (claim 7) is anticipated by D4 (D4: Figure 7) and also by D1 (D1: column 2, lines 35ff.).
- 2.4 As a consequence, clarified claims 5-7 would either not be novel or not be inventive in the sense of the PCT.
3. The relevance of document D2 in combination with D1 for assessing the inventive step is postponed until a new set of claims is filed overcoming the raised objections with respect to clarity and conciseness.

## Section VII-VIII (Deficiencies in Form, Content, Clarity)

1. **Claim 1** does not fulfill the requirements of Art. 6 PCT in that the matter for which protection is sought is not clearly defined.
  - 1.1 Having regard to the feature "a user interface ... to indicate how important ... of predetermined features are .." it is noted that the "importance of a predetermined feature" is unclear as neither the nature of the "importance" is defined in the claim nor how such an importance shall be quantified.

The formula on page 10 of the description suggests that the importance is defined as a numeric value; moreover, according to Figure 1, it appears that this value has to be from a predetermined interval of numeric values which express a range from "not important" to "very important".

It is further noted that it is unclear what specific technical effect is achieved by a user interface for indicating the importance of a feature. Any information sorting system

is understood to comprise a user interface which allows a user to interact with the system, i.e. for entering data into the system and for outputting data to the user.

- 1.2 Having regard to the feature of "means for calculating a score", it is noted that the definition-by-a-formula is too broad: the formula merely defines that there is some sort of functional relationship between three parameters, one called overall score, a second called individual score, and a third called importance. This definition provides no information at all about how such an "overall score" shall be determined. A further lack of clarity arises as there is no definition in claim 1 of the feature "individual score" nor how this feature shall be determined.
- 1.3 Due to the lack of clarity, the above features are disregarded from the feature examination.
- 2.1 **Claims 1 and 4 seek to define the invention by reference to features of its use, i.e. "an information sorting system for use in ranking ..." (claim 1) and "a ... method for aiding ... for use in conjunction with an interaction device" (PCT/GL/III-4.8)** and a lack of clarity results.
- 2.2 In particular, claim 4, which is aimed at defining a method, relies on features which define an interaction device, i.e. "[means] for delivering product data from a remote server to the interaction device ...", "adjust preference information using the graphical preference mechanism [of a display means comprised by said interaction device]", "within the interaction device ... recommendation logic ..." and "within the interaction device ... display logic ...". A lack of clarity results from the ambiguous definition of the subject matter of claim 4.
- 3.1 **Claims 4-7 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined.** The claims attempt to define the subject-matter at hand of terms which do not have a precise technical meaning and which therefore obscure the claims (PCT Guidelines C-III, 4.1-4.3) :
  - the feature "preference information" is not clearly enough defined and leaves the doubt about how the desired technical effect of its entering, adjusting and displaying is achieved;

- the feature "preference criteria" does not have a precise technical meaning and should have been defined in the claim;
- the feature "an evaluation of said products ... " is unclear and should have been defined in the claim;
- the feature "instructions to the interaction device on how to configure the display ..." is not defined and its technical effect is unclear;
- it is unclear of what should be understood by the feature "recommendation" of a product and "a recommendation leading products";
- the feature "recommendation logic executes so that ..." is not precise enough and leaves the doubt about the desired technical effect and how it is achieved. The same objection is raised with respect to the feature "display logic executes so that ...". In fact, both features are defined by the result to be achieved and leave the doubt about the feature itself; it is not directly derivable for the skilled person of how to implement them;
- the technical effect of a combination of the features "preference criteria", "preference information" and "evaluation" - which is understood from the description to be necessary in order to realise the recommendation logic" is unclear;
- expressions as "substantially" and "preferably" introduce ambiguity.

3.2 As a consequence, the subject matter of claim 4 is so unclear that no examination of this claim and the dependent claims is seen as possible at this stage.

3.3 It is underlined that according to Art. 6 and PCT/GL/4.1 a claim shall be worded such that its meaning is **clear from the wording of the claim alone**.

4. **A lack of conciseness arises between claims 1 and 4**, which is manifested by the following facts :

4.1 It is not clear what should be considered as the essential features of the claimed invention. Both claims differ substantially from one another, for example, claim 4 defines a "display device" which is missing from the subject matter of claim 1 but is only defined in dependent claim 2. Even more important, claim 4 is silent about the definition of a product in terms of features and of associated information which are both used for the ranking a product. These features considered to be essential.

- 4.2 Claim 4 defines a method for products only whereas claim 1 defines a system for products and services. Neither in claim 1 nor in claim 4, a product or a service is clearly defined. Claim 1 defines a product or service by a set of predetermined features and no other difference is defined; hence, there is no evidence which would justify to use two different terms for a same single feature.
- 4.3 A **non-unity objection** could be raised in a subsequent examination step having regard to claims 1 and 4: while claim 1 is directed to a information sorting system which ranks information, claim 4 is directed to a decision aid method. Claim 4 does not define a ranking step, score of a product, source of a feature and the importance of features. Instead, claim 4 relies on a more vague wording where recommendations are determined and remains, however, silent about the (technical) definition of such a recommendation and how such a recommendation is determined at all.
- 4.4 For illustration, an example of diverging features is given: claim 4 uses the feature "preference information" which appears to correspond to the "importance" used in claim 1. However, such a correspondance is not evident as there is no notion in claim 4 of "predetermined features".

The applicant is informed that one single term is to be used through-out the application for each feature. A lack of clarity arises.

5. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT). The claims should be adapted accordingly.
6. Documents reflecting the prior art described on pages 4 and 5 are not identified in the description (Rule 5.1(a)(ii) PCT).

## Other matters

1. In order to facilitate the examination of the conformity of the amended application with the requirements of Art. 34(2) PCT, the applicant is requested to clearly identify the amendments carried out, no matter whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT).

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SEPARATE SHEET**

International application No. PCT/GB99/01031

2. If the applicant regards it as appropriate these indications could be submitted in handwritten form on a copy of the relevant parts of the applicant as filed. The applicant is requested to file amendments by way of replacement pages in the manner stipulated by Rule 66.8(a) PCT. Fair copies of the amendments should be filed in triplicate.
3. Moreover, the applicant's attention is drawn to the fact that, as a consequence of Rule 66.8(a) PCT the examiner is not permitted to carry out any amendments under the PCT procedure, however minor these may be.

**Claims**

1. An information sorting system for use in ranking a plurality of products/services according to the apparent desirability of each product/service to a system user which comprises:

- a memory means which stores information on the plurality of services/products in the form of scores relating to a number of predetermined features of the products/services;

- a user interface which allows a user to indicate how important each of the number of predetermined features are to them

- calculating means for calculating a score for each product/service according to the following formula:

$$S_p = f(s_{i,p}, I_i); \quad i \in \{1 \dots N\}; \quad p \in \{1 \dots Q\}$$

wherein

$S_p$  represents the overall score for a particular product  $p$

$f(\dots)$  represents 'a function of'

$s_{i,p}$  represents the individual score for feature  $i$  of product  $p$  (in the range from  $s_{min}$  to  $s_{max}$ )

$I_i$  represents the importance of feature  $i$  to the user

$N$  represents the number of predetermined features

$Q$  represents the number of products/services

2. An information sorting system according to claim 1 which further comprises display means for displaying a ranked list of products/services to the user.

3. An information sorting system according to claim 1 which is used as part of a control system in which the product/service with the highest score is used as a basis for automatically deciding which control strategy 5 from a plurality of available control strategies is to be executed by the control system.
4. A technically-implemented decision aid method for aiding the decision-making process of a user for use in conjunction with an interaction device, which is connected to an information network, such as the internet, and a display means of which interaction device displays graphical preference mechanisms for entering, adjusting and displaying preference 10 information and a synopsis of recommended products, 15 wherein the method involves the following steps:
- product data from a remote server is delivered to the interaction device, which product data contains 20 information concerning products, relevant preference criteria such products, an evaluation of such products with regard to the preference criteria and instructions to the interaction device on how to configure the display means of the interaction 25 device;
  - the user is enabled to enter or adjust preference information using the graphical preference mechanisms;
  - within the interaction device, recommendation logic executes so that a recommendation of leading products is made substantially immediately following the user entering or adjusting preference 30 information using the graphical preference mechanisms;
  -

- within the interaction device, display logic executes so that at least some elements of a synopsis of new recommendations are updated on the display substantially immediately after new recommendations are made by the recommendation logic;
  - the user is enabled to indicate one of the recommended products using a pointing or similar selection device, such as a mouse.
5. A technically implemented decision aid method according to claim 4 in which the graphical preference mechanisms consist of graphical slider mechanisms.
- 15
6. A technically implemented decision aid method according to either of claims 4 or 5 in which the display means also displays detailed information about one of the recommended products.
- 20
7. A technically implemented decision aid method according to any of claims 4 to 6 in which the display means also displays a graphical pre-select mechanism for pre-selecting a subset of the available products from
- 25
- which recommendations are to be made.

**PATENT COOPERATION TREATY**

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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**PCT**

**NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT  
(PCT Rule 71.1)**

Date of mailing (day/month/year)	03.08.2000
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Applicant's or agent's file reference  
X042/P491

**IMPORTANT NOTIFICATION**

International application No. PCT/GB99/01031	International filing date (day/month/year) 21/04/1999	Priority date (day/month/year) 21/04/1998
-------------------------------------------------	----------------------------------------------------------	----------------------------------------------

Applicant  
CAMBRIDGE CONSULTANTS LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

**4. REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

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## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference  X042/P491	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No.  PCT/GB99/01031	International filing date ( <i>day/month/year</i> )  21/04/1999	Priority date ( <i>day/month/year</i> )  21/04/1998
International Patent Classification (IPC) or national classification and IPC  G06F17/60		
Applicant  CAMBRIDGE CONSULTANTS LIMITED et al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 4 sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I   <input checked="" type="checkbox"/> Basis of the report</li> <li>II   <input type="checkbox"/> Priority</li> <li>III   <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV   <input type="checkbox"/> Lack of unity of invention</li> <li>V   <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI   <input type="checkbox"/> Certain documents cited</li> <li>VII   <input checked="" type="checkbox"/> Certain defects in the international application</li> <li>VIII   <input checked="" type="checkbox"/> Certain observations on the international application</li> </ul>		

Date of submission of the demand  22/11/1999	Date of completion of this report  03.08.2000
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx. 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Glaser, N  Telephone No. +49 89 2399 8336



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/01031

**I. Basis of the report**

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

**Description, pages:**

1-15                   as originally filed

**Claims, No.:**

1-8                   as received on                   19/07/2000 with letter of                   17/07/2000

**Drawings, sheets:**

1-3                   as originally filed

2. The amendments have resulted in the cancellation of:

- the description,       pages:  
 the claims,              Nos.:  
 the drawings,           sheets:

3.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- the entire international application.  
 claims Nos. 8.

because:

**INTERNATIONAL PRELIMINARY  
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- the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
  
- the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 8 are so unclear that no meaningful opinion could be formed (*specify*):  
**see separate sheet**
  
- the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
  
- no international search report has been established for the said claims Nos. .

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims 1-7
	No:	Claims
Inventive step (IS)	Yes:	Claims 1-7
	No:	Claims
Industrial applicability (IA)	Yes:	Claims 1-7
	No:	Claims

**2. Citations and explanations**

**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

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**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

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International application No. PCT/GB99/01031

The examination is being carried out on the application documents as **follows** :

**Description, pages:**

1-15 as originally filed

**Claims, No.:**

1-19 as received on 19/07/2000 with letter of 17/07/2000

**Drawings, sheets:**

1-3 as originally filed

Reference is made to the following documents :

- D1: US-A-5 717 865 (STRATMANN WILLIAM C) 10 February 1998 (1998-02-10)  
D2: WO 95 29452 A (APPLE COMPUTER ;ROSE DANIEL E (US); BORNSTEIN JEREMY J (US);  
TIENE) 2 November 1995 (1995-11-02)  
D3: AHLBERG C ET AL: 'DYNAMIC QUERIES FOR INFORMATION EXPLORATION: AN  
IMPLEMENTATION AND EVALUATION' STRIKING A BALANCE, MONTEREY, MAY 3 - 7, 1992,3  
May 1992 (1992-05-03), pages 619-626, XP000426842 BAUERSFELD P; BENNETT J; LYNCH G

**Section III (No opinion)**

1. **Claim 8** lacks clarity as the technical features of the subject matter for which protection is sought are unclear from the current claim wording, i.e. the features of the computer program are unclear. When defining a computer program product a claim wording such as "a computer program product comprising computer program code means adapted to perform all the steps of the method of claim X when said program is run on a computer" would allow for a clear correspondence between the features of said computer program product and the steps of a method on which it is based.

**Section V (Novelty, Inventive Step)**

- 1.1 Document **D1** is considered to be the closest prior art. D1 discloses a technically-implemented decision aid system, comprising the features recited in **claim 1** :
  - "a memory means which stores product data ... and user information ..." (D1: column 2, lines 35-63; Figure 2, column 3 line 35 to column 5 line 24);

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- "a user interface ... comprises an input device ... a display device ..." (D1: column 2, lines 35-63; Figure 2, column 3 line 35 to column 5 line 24);
  - "a calculating means ... calculates an overall score ... and ranks the plurality of products ..." (D1: column 4, lines 27 to 63);
  - "wherein the display device displays a current set of user-importance-scores ... and at least a portion of the ranked list of products" (D1: column 4, lines 27 to 63; Figures 5-8 for entering scoring values and Figure 9 for displaying the ranked list).
- 1.2 A possible difference between claim 1 and D1 appears to be that D1 does not explicitly disclose the feature of a simultaneous display of a current set of user-importance-scores and at least a portion of the ranked list of products. According to the description the feature "simultaneously display" is interpreted as presenting two types of information at the same time to a user (either on one single window or on several windows which are open at the same time).
- 1.3 Now, it is assumed that Figures 5-9 of D1 illustrate different display windows of the user interface for entering and for displaying data. Having entered user data (Figures 5-8), the D1 system determines a ranking which is subsequently displayed (Figure 9) to the user. It is acknowledged that there is no explicit notion in D1 of simultaneously displaying at the same time "a current set of user-importance-scores" and "at least a portion of the ranked list of products". Information is displayed and entered on subsequent windows. Figures 7 and 8 provide an interface for the entering of information via a scroll bar for choice items which have been selected by the user. The process is understood as follows : the user selects one after the other a choice item and assigns a value via the scroll bar to each of them. Having assigned a value to a choice item, selecting the choice item again the scroll bar shows the assigned value which can then be updated in changing the slider to another position. The described process is a simultaneous display of user-entered values and a list of information items. However, there is no simultaneous display of "a current set of user-importance-scores" and "at least a portion of the ranked list of products", the latter being a result of processing.
- 1.4 D1 produces a ranking which is possibly not accepted by the ser due to incomplete or missing information on a use's choice (D1: column 4, line 60f.). The lack of

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information is taken into consideration in the ranking process. An improvement of the D1 system would be to grant the user to back-track to a previous state, i.e. to display the corresponding interface windows, in order to complete the missing information. Such a solution would be complete.

- 2.1 D2 is concerned with information filtering where a feature vector is matched against a user interest vector and results are displayed in form of a ranked list (D2: Figure 3) which may be displayed in form of a portion of said ranked list (D2: page 7, lines 10-30). The user defines his interest parameters (i.e. importance) for particular messages (i.e. products); this is explained on page 8, lines 16-29, where it is stated that the interest values can be fine grained (which are generally speaking values from an interval). The ranking is explained on page 9, lines 19-29, whereby the ranking each time interest values change (D2: page 15, lines 19ff.) as well as it can take other types of information into account (D2: page 14, lines 1-6).
- 2.2 D2 does not disclose a simultaneous display of the current set of user-importance-scores and at least a portion of the ranked list of products. Figure 3 illustrates a simultaneous display of user-related scores and a ranked list. However, these scores have been automatically computed based on the entered user interest parameters; there is neither a direct input of the user scores nor a display of the user interest parameters.
3. D3 is a good reference for an interactive display where user-entered values are simultaneously displayed with a subset of data which has been retrieved from a predetermined data set based on the user input. The feature of using "graphical slider mechanisms" is disclosed by D3 (D3: Figure 1, page 620, third paragraph, and Section 2.3.1). The advantages of sliders are known to a skilled person in the art, i.e. limiting the input of a user to a predetermined set of values. However, there is no ranking in D3 and no incentive to use such a step.
4. As a consequence claims 1-7 have to be considered as novel and inventive over the prior art on file.

## Section VII-VIII (Deficiencies in Form, Content, Clarity)

1. Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
2. In the present case, the following features are known in combination from the document D1 and belong in the preamble of such a claim:
  - "product data, which comprises ..." (D1: Figures 3-6 whereby "choices" correspond to products, "decision components/criteria" to features" and relevant scores to feature scores);
  - "user information ..." (D1: Figure 7-8 whereby "satisfaction" and "reliability" can be compared to the user-importance-scores);
  - "user interface ..." (D1: Figures 1-9);
  - "calculating means ..." (D1: column 3 to column 5).

D1 is performing as well as the claimed invention as ranking based on the calculation of a ranking value from the scores assigned to product features and from user entered values.

3. Documents reflecting the prior art described on pages 4 and 5 are not identified in the description (Rule 5.1(a)(ii) PCT).The description should have been adapted accordingliny.

Claims

09/673790

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1. A technically-implemented decision aid system,  
5 which aids a user who is engaged in a selection task,  
such as a purchasing decision;

10 and, which comprises:

15 - a memory means which stores:

20 - product data, which comprises data relating to a plurality of products and which product data is in the form of a plurality of product-feature-scores ( $s_{i,p}$ ), wherein each individual product-feature-score ( $s_{i,p}$ ) relates to one of a number of predetermined product-features (i) for one of the plurality of products (p) and wherein said product-feature-scores ( $s_{i,p}$ ) are values which are constrained to be from predetermined intervals of values ( $s_{min}$  to  $s_{max}$ ); and

25 - user information, which comprises information relating to preferences of the user and which user information is in the form of a plurality of user-importance-scores ( $I_i$ ) relating to the importance which the user attaches to each of the number of predetermined product-features (i) wherein the user-importance-scores ( $I_i$ ) are values which are constrained to be from a predetermined interval of values which expresses a range of possible levels of importance of a product-feature to the user;

30 - a user interface which allows the user to interact with the decision aid and which comprises:

- an input device for entering data, such as user-importance-scores ( $I_i$ ), into the decision aid; and

5

- a display device for outputting data to the user;

- a calculating means which:

10

- calculates an overall score ( $S_p$ ) for each of the plurality of products as a function of product-feature-scores ( $s_{i,p}$ ) and user-importance-scores ( $I_i$ ); and

15

- ranks the plurality of products according to the calculated overall scores ( $S_p$ ) to form a ranked list of products;

20

wherein the display device simultaneously displays:

- a current set of user-importance-scores ( $I_i$ ); and
- at least a portion of the ranked list of products;

25

wherby the technically-implemented decision aid system provides the user with a visual context, which assists the decision-making process by reminding the user of the user-importance-scores ( $I_i$ ) which have been entered whilst simultaneously displaying at least a portion of the ranked list of products.

30

2. A technically-implemented decision aid system according to claim 1 in which product data stored in the memory means further comprises detailed-product-information about each of the plurality of products and in which the display device further simultaneously displays detailed-product-information about one of the products

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8. Computer software, particularly a computer program on a data carrier, which when run on a data processor, implements a technically-implemented decision aid system according to any of the preceding claims.

09673790

Arthur D. Little

Cambridge Consultants

422 Rec'd PCT/PTO 20 OCT 2000

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European Patent Office  
D-80298 Munich  
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International application number: PCT/GB99/01031  
Our ref: X042/P491

17<sup>th</sup> July 2000

Dear Sir/Madam,

**Response to Examiner's communication of 3<sup>rd</sup> July 2000 for PCT/GB99/01031**

Please find enclosed:

- replacement pages 16 to 19, containing a replacement set of claims 1 to 8 to replace, without prejudice, the set of claims currently on file (in triplicate).
- An annotated version of replacement pages 16 to 19, showing the amendments made.

**1. Clarity**

The examiner's objections as to form, content and clarity (paragraphs 2. and 3.) have been carefully considered and the following amendments have been made to the claims (reference to examiner's paragraphs given in parentheses):

- (2.) The offending section has been deleted from the claim.
- (3.1) The offending section has been deleted from the claim. In this respect, it is respectfully submitted that the words 'such as a purchasing decision' in the current version of claim 1 add, rather than subtract, from the clarity of the claim. Whilst it is acknowledged that such a phrase has no limiting effect on the claim, it is felt that giving 'a purchasing decision' as an example of 'a selection task' helps a reader to understand the meaning of 'a selection task'.
- (3.2) Claim 1 has been reworded to define 'a technically-implemented decision aid system' and a clarified definition of the system has been put in to replace the phraseology to which the examiner objected (basis for this amended definition may be found in the application as published at page 8, lines 25 to 29 and page 1, lines 29 to 30). The definition of the purpose of the system has been further clarified by the addition of a paragraph at the end of claim 1 to indicate the overall effect of the system (basis for this may be found in the application as published at page 8, lines

/continued...



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FM 10720

An Arthur D. Little Company  
Registered Number: 1036298 England

17<sup>th</sup> July 2000

### 3.2 *Inventive step vis-à-vis document D1*

The Examiner argues (paragraphs 5.1 to 5.4) that the subject-matter of claim 1 is not inventive with respect to a combination of the teaching of D1 with "standard knowledge of the design of user interfaces".

The Examiner states that "D1 states that an obtained ranking may not be accepted as final result *due to incomplete or missing information* on a use[r]'s choice" (emphasis added). The Examiner continues that "different rankings are mentioned which implies that support is given to a user who wants to go back to a previous step in order to modify his user-set values".

Firstly, it is noted that not only is D1 silent about a simultaneous display, but that it would be contrary to the teaching of D1 for there to be such a simultaneous display. Figure 10 of D1 and the description of D1 clearly indicate a sequential process. Given that the teaching concerns a sequential process, there would be no point in displaying information about a preceding or a later step since the user is concerned with only one step at one time. Moreover user interface design teaches that only information relating to a current task should be presented to a system user and that it is confusing to present information unrelated to a current task. Hence it would be contrary to the teaching of D1 and 'standard knowledge of the design of user interfaces' to provide such a simultaneous display.

Secondly, the section of D1 cited by the Examiner in this respect (column 4, line 60f) does *not* give any indication that a user might wish to back-track. This section merely indicates that "decision components can also be rank ordered by reliability to show the effect of incomplete or missing information on the user's choice". As stated above, the disclosure of D1 does not in any way indicate that a user might want to go back to a previous step. It is noted, for instance, that whilst the system of the present application provides a simultaneous display, and thus supports a user's decision-making process, whether or not there is any missing or incomplete information, the system of D1 does not provide such a simultaneous display and only suggests providing a reliability-ranked list when there is missing or incomplete information.

Thirdly, the examiner's attention is directed to the fact that while D1 may or may not allow a user to go back to a previous step, D1 does not in any way hint at this being a problem. It is only the teaching of the present application which indicates that such back-tracking is, indeed a problem which can lead to ineffective decision-making or even lack of a decision (cf. page 3 line 10 to page 5, line 36) and, since D1 does not see a problem, D1 does not and cannot offer a solution.

Thus, for any and all of the above reasons, the subject-matter of claim 1 involves an inventive step with regard to the disclosure of D1.

17<sup>th</sup> July 2000

memory of a user when they are deciding between a plurality of products, i.e. none of the documents on file indicate the problem posed by short-term memory difficulties which a user faces in having to change between different information displays when attempting to make comparisons between products. Also, none of the documents on file disclose or hint at enabling a user to see a ranked list simultaneously to seeing the choices which the user has made in generating the ranked list.

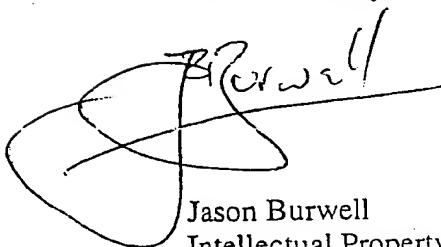
The inventive step involved in using a simultaneous display of information relating to different decision-making steps provides at least the following advantages: the simultaneous display provides supplementary short-term memory required for the user easily to make the decision; and, given the simultaneous display, the user may optionally iterate and experiment with alternative options (such an ability further aids the user to easily make their decision).

The subject-matter of independent claim 1 thus provides a very useful advance on the present state of the art, is novel and involves an inventive step with regard to the documents on file.

Dependent claims 2 to 8 define further embodiments and their subject-matter therefore likewise is novel and involves an inventive step.

The Examiner is respectfully requested to issue an IPER indicating the novelty and presence of an inventive step in the subject-matter of the claims currently on file.

Yours sincerely

A handwritten signature in black ink, appearing to read "Burwell". It is written over a stylized oval-shaped graphic element.

Jason Burwell  
Intellectual Property Manager

Final w/ letter of  
17/7/00

09/673790

## Claims

422 Rec'd PCT/PTO 20 OCT 2000

1. A technically-implemented decision aid system,

5 which aids a user who is engaged in a selection task,  
such as a purchasing decision;

and, which comprises:

10 - a memory means which stores:

15 - product data, which comprises data relating to a plurality of products and which product data is in the form of a plurality of product-feature-scores ( $s_{i,p}$ ), wherein each individual product-feature-score ( $s_{i,p}$ ) relates to one of a number of predetermined product-features (i) for one of the plurality of products (p) and wherein said product-feature-scores ( $s_{i,p}$ ) are values which are constrained to be from predetermined intervals of values ( $s_{\min}$  to  $s_{\max}$ ); and

20 - user information, which comprises information relating to preferences of the user and which user information is in the form of a plurality of user-importance-scores ( $I_i$ ) relating to the importance which the user attaches to each of the number of predetermined product-features (i) wherein the user-importance-scores ( $I_i$ ) are values which are constrained to be from a predetermined interval of values which expresses a range of possible levels of importance of a product-feature to the user;

25 - a user interface which allows the user to interact with the decision aid and which comprises:

on the displayed portion of the ranked list of products.

3. A technically-implemented decision aid system according to claim 2 in which the product for which detailed-product-information is displayed may be selected by the user using the input device to indicate one of the products on the displayed portion of the ranked list of products for which detailed-product-information should be displayed.  
5
4. A technically-implemented decision aid system according to any of the preceding claims in which product data is obtained from a remote server on an information network, such as the internet.  
15
5. A technically-implemented decision aid system according to claim 4 in which configuration-information regarding the configuration of the display device is also obtained from the remote server and in which the display device is subsequently configured according to said configuration-information.  
20
6. A technically-implemented decision aid system according to any of the preceding claims in which the input device comprises a graphical preference mechanism, such as a graphical slider mechanism, which displays a current set of user-importance-scores ( $I_i$ ) while allowing the user to alter the current user-importance-scores ( $I_i$ ).  
25
7. A technically-implemented decision aid system according to any of the preceding claims which further comprises a pre-selecting means for pre-selecting the plurality of products as a subset from a larger plurality of products.  
30  
35

8. Computer software, particularly a computer program on a data carrier, which when run on a data processor, implements a technically-implemented decision aid system according to any of the preceding claims.

European Patent Office  
D-80298 Munich  
Germany

International application number: PCT/GB99/01031  
Our ref: X042/P491

10<sup>th</sup> May 2000

Dear Sir/Madam

**Response to first written opinion for PCT/GB99/01031**

Please find enclosed:

- replacement pages 16 to 18, containing a replacement set of claims 1 to 8 to replace, without prejudice, the set of claims currently on file (in triplicate).
- A hand-annotated version of replacement pages 16 to 18, wherein the hand annotations indicate the basis within the filed application for the replacement set of claims.

**Clarity issues**

The examiner's objections as to form, content and clarity (section VII-VII) have been carefully considered and the following amendments have been made to the claims (reference to examiner's paragraphs given in parentheses):

- (1.1) In line with the examiner's suggestions, the term 'importance' has been more clearly specified such that 'product-feature-scores' are values which are constrained to be from predetermined intervals of values each of which expresses a range of possible strengths or states of a product-feature' and 'user-importance-scores' are values which are constrained to be from a predetermined interval of values which expresses a range of possible levels of importance of a product-feature to the user'. It is noted that the examiner had suggested the use of 'numerical values'; it is respectfully submitted that this would be unduly restrictive since it would be a simple matter for a copier of the technology to use a non-numeric set of values and achieve the object of the present invention. It is also noted that the examiner suggested a range from 'not important' to 'very important'; it is respectfully submitted that such language in the claim would also be unduly restrictive.
- (1.1) The user interface has been defined as the type of user interface commonly understood, as indicated by the examiner.
- (1.2) The calculating means has been defined in words, rather than a formula, as



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desired by the examiner. Overall scores and individual scores have also been more clearly defined in the new wording of the claims.

- (2.1, 2.2, 4., 4.1, 4.2, 4.3 & 4.4) The new set of claims contains only one independent claim (claim 1) and this claim is directed towards 'a technically implemented decision aid'. All the limiting features of the claims are features of an interaction device and not features of its use.
- (3.1) The examiner's detailed points of clarity have been addressed in the new set of claims.
- Other form objections will be dealt with at a later stage before the regional/national patent offices.

#### Basis in original application

Unfortunately, the new set of claims have been amended such that indication of amendments vis-à-vis the previous set of claims is difficult.

Instead of an annotated version of the original claims, we enclose herewith an annotated version of the new set of claims in which the basis for the amendments has been indicated (Art. 34(2)(b) & Rule 66.8(a) PCT).

#### Novelty/Inventive Step

The application contains a single independent claim, claim 1.

The subject-matter of claim 1 concerns a technically-implemented decision aid.

This decision aid has an input device and a display.

The decision aid's memory stores:

- information on products in the form of product-feature-scores; and
- information on a user's preferences in the form of user-importance-scores.

An overall score is calculated for each product, based on the product feature scores and the user importance scores. Products are ranked in order of their overall scores to form a ranked list.

The decision aid simultaneously displays the current set of user-importance-scores and the ranked list of products (or at least a portion of that list).

Of the documents cited in the examination procedure, D1 represents the closest prior art, in that it discloses an information sorting system which produces an overall score with some similarity to that of claim 1 of the present invention and in that it ranks the products, allowing a user to determine the choice item with the greatest score.

10<sup>th</sup> May 2000

None of the documents on file indicate the problem of supporting the short-term memory of a user when they are deciding between a plurality of viable products, i.e. none of the documents on file indicate the problem posed by short-term memory difficulties which a user faces in having to change between different information displays when attempting to make comparisons between products.

None of the systems of the documents on file enable a user to see a ranked list in the same field of view as the choices which the user has made in generating the ranked list (cf. page 4, line 15 to page 5, line 36 and page 15, lines 11 to 21 of the present application).

The subject-matter of independent claim 1 is thus novel and involves an inventive step with regard to the documents on file.

Dependent claims 2 to 8 define further embodiments and their subject-matter therefore likewise is novel and involves an inventive step.

For the sake of completeness, it is noted that:

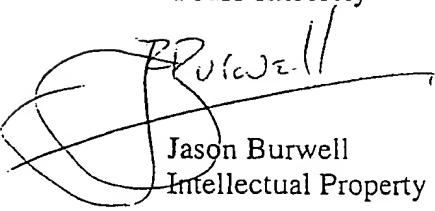
D2 discloses a system which displays a ranked list of data objects, but does not disclose a system which allows a user to view their input preferences at the same time as viewing the ranked list.

D3 discloses the use of graphical slider mechanisms.

D4 discloses an e-commerce catalogue, which does not produce a preference-ranked list of products. A user merely navigates through the system through the use of drop-down / pop-up menus and must then 'pogo-stick' between detailed product descriptions (cf. page 4, line 33 to page 5, line 10 of the present application).

If the examiner intends to issue an international preliminary examination report (IPER) which is negative regarding the novelty of and presence of an inventive step in the current set of claims, then the applicant herewith requests that the examiner grant the applicant the opportunity to have a personal interview with the examiner before such an IPER is issued (Rule 66.6 PCT).

Yours sincerely

  
Jason Burwell  
Intellectual Property Manager

Cancelled 17/10/03

## Claims

422 Rec'd PCT/PTO 20 OCT 2000

1. A technically-implemented decision aid, ~~for example,~~ which aids a user in making a decision when they are selecting ~~one product~~ between a plurality of generally suitable products (for example, consumer products or service offerings) which are offered to the user ~~via the decision aid~~

10 and, which comprises:

- a memory means which stores:

15 - product information on the plurality of products which comprises information in the form of a plurality of product-feature-scores each relating to one of a number of predetermined product-features for each product wherein said product-feature-scores are values which are constrained to be from predetermined intervals of values each of which expresses a range of possible strengths or states of a product-feature; and

25 - user information on preferences of the user which comprises information in the form of a plurality of user-importance-scores relating to the importance which the user attaches to each of the number of predetermined product-features wherein the user-importance-scores are values which are constrained to be from a predetermined interval of values which expresses a range of possible levels of importance of a product-feature to the user;

30

35 - a user interface which allows the user to interact with the decision aid and which comprises:

- an input device for entering data, such as user-importance-scores, into the decision aid; and
- 5
  - a display device for outputting data to the user;
- a calculating means which:
- 10
  - calculates an overall score for each of the plurality of products as a function of product-feature-scores and user-importance-scores; and
- 15
  - ranks the plurality of products according to the calculated overall scores to form a ranked list of products;

wherein the display device simultaneously displays:

- 20
  - a current set of user-importance-scores; and
  - at least a portion of the ranked list of products.
- 25           2. A technically-implemented decision aid according to claim 1 in which product information stored in the memory means further comprises detailed-product-information about each of the plurality of products and in which the display device further simultaneously displays detailed-product-information about one of the products on the displayed portion of the ranked list of products.
- 30           3. A technically-implemented decision aid according to claim 2 in which the product for which detailed-product-information is displayed may be selected by the user using the input device to indicate one of the products on the displayed portion of the ranked list of

products for which detailed-product-information should be displayed.

4. A technically-implemented decision aid according to any of the preceding claims in which product information is obtained from a remote server on an information network, such as the internet.
5. A technically-implemented decision aid according to claim 4 in which configuration-information regarding the configuration of the display device is also obtained from the remote server and in which the display device is subsequently configured according to said configuration-information.
- 15 6. A technically-implemented decision aid according to any of the preceding claims in which the input device comprises a graphical preference mechanism, such as a graphical slider mechanism, which displays a current set of user-importance-scores while allowing the user to alter the current user-importance-scores.
- 20 7. A technically-implemented decision aid according to any of the preceding claims which further comprises a pre-selecting means for pre-selecting the plurality of products as a subset from a larger plurality of products.
- 25 8. Computer software, particularly a computer program on a data carrier, which when run on a data processor, implements a technically-implemented decision aid according to any of the preceding claims.

09/673790

Claims

422 Rec'd PCT/PTO 20 OCT 2000

1. A technically-implemented decision aid,

page 17, line 1

5 which aids a user in making a decision when they are page 1,  
selecting between a plurality of generally suitable lines 29-3  
products (for example, consumer products or service  
offerings) which are offered to the user;

10 and, which comprises:

- a memory means which stores:

15 - product information on the plurality of products  
which comprises information in the form of a page 16,  
plurality of product-feature-scores each lines 8-11  
relating to one of a number of predetermined &  
product-features for each product wherein said Figure 1  
product-feature-scores are values which are &  
constrained to be from predetermined intervals page 10,  
of values each of which expresses a range of lines 33-36  
possible strengths or states of a product-  
feature; and

25 - user information on preferences of the user  
which comprises information in the form of a page 16,  
plurality of user-importance-scores relating to lines 13-15  
the importance which the user attaches to each &  
of the number of predetermined product-features Figure 1  
wherein the user-importance-scores are values &  
which are constrained to be from a predetermined page 10,  
interval of values which expresses a range of lines 33-36  
possible levels of importance of a product-  
feature to the user;

35

- a user interface which allows the user to interact page 7,  
with the decision aid and which comprises:  
lines 10-27.

- an input device for entering data, such as user-importance-scores, into the decision aid; and
  - a display device for outputting data to the user;
  - a calculating means which:
    - calculates an overall score for each of the plurality of products as a function of product-feature-scores and user-importance-scores; and
    - ranks the plurality of products according to the calculated overall scores to form a ranked list of products;

wherein the display device simultaneously displays:

- 20        - a current set of user-importance-scores; and  
            - at least a portion of the ranked list of products.  
  
25        2. A technically-implemented decision aid according to  
            claim 1 in which product information stored in the  
            memory means further comprises detailed-product-  
            information about each of the plurality of products and  
            in which the display device further simultaneously  
            displays detailed-product-information about one of the  
            products on the displayed portion of the ranked list of  
            products.  
  
30        3. A technically-implemented decision aid according to  
            claim 2 in which the product for which detailed-  
            product-information is displayed may be selected by the  
            user using the input device to indicate one of the  
            products on the displayed portion of the ranked list of  
            products.

products for which detailed-product-information should be displayed.

4. A technically-implemented decision aid according to any of the preceding claims in which product information is obtained from a remote server on an information network, such as the internet.  
*page 17,  
lines 10-12  
&  
lines 18-20*
5. A technically-implemented decision aid according to claim 4 in which configuration-information regarding the configuration of the display device is also obtained from the remote server and in which the display device is subsequently configured according to said configuration-information.  
*page 17,  
lines 23-25*
6. A technically-implemented decision aid according to any of the preceding claims in which the input device comprises a graphical preference mechanism, such as a graphical slider mechanism, which displays a current set of user-importance-scores while allowing the user to alter the current user-importance-scores.  
*page 18,  
lines 12-14  
&  
Figures 1&3*
7. A technically-implemented decision aid according to any of the preceding claims which further comprises a pre-selecting means for pre-selecting the plurality of products as a subset from a larger plurality of products.  
*page 18,  
lines 21-25  
&  
page 13,  
lines 10-15  
&  
page 12,  
lines 11-16*
8. Computer software, particularly a computer program on a data carrier, which when run on a data processor, implements a technically-implemented decision aid according to any of the preceding claims.  
*whole document.*

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BURWELL, Jason, Rowell  
Cambridge Consultants Ltd.  
Science Park  
Milton Road  
Cambridge CB4 0DW  
GRANDE BRETAGNE

PCT

NOTIFICATION CONCERNING INFORMAL  
COMMUNICATIONS WITH THE APPLICANT

(PCT Rule 66.6)

	Date of mailing (day/month/year)	03.07.2000
Applicant's or agent's file reference  X042/P491	<b>REPLY DUE</b>	within 14 days from the above date of mailing
International application no.  PCT/GB99/01031	International filing date (day/month/year)	21/04/1999
Applicant  CAMBRIDGE CONSULTANTS LIMITED et al.		

An informal communication took place on 26/06/2000, between the International Preliminary Examining Authority and the applicant / the agent.

**Invitation pursuant to Rules 66.2 c), 66.3 and 66.4 of the PCT**

Further examination of the international application has revealed that the application fails to meet the requirements of the PCT and the Regulations as explained in the attached note (Form PCT/IPEA/428).

The Applicant is hereby **invited**, within the time limit indicated above, **to submit a written reply** accompanied by amendments.

If no reply is submitted, the international preliminary examination report will reflect the opinion expressed by this Authority.

Name and mailing address of the international preliminary examining authority  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Schall, H  Telephone No. +49 89 2399-2647	
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PCT

Rec'd PCT/PTO 20 OCT 2000

Application No.:

PCT/GB99/01031

Note on an informal communication by telephone with the Applicant

Transmittal of a copy of this note with a time limit of 14 days

Participants

Applicant: Martin, S.

Agent: Burwell, J

Examiner(s): Glaser, N

Summary of the communication

1. The interview took place on 26.6.2000 from 9h45 a.m. until 11h00 a.m. to discuss major clarity objections (Art. 6 PCT) and a lack of inventive step (Art. 33(2,3) PCT) over combinations of the prior art as detailed in the following.

A non-extendable deadline is set for the applicant's reply to the 12. July 2000.

2. **Claim 1** comprises subject matter which extends beyond the content of the application as originally filed (**Art. 19(2) and 34(2b) PCT**). This concerns the feature "states of a product feature" in the feature definition "... said product-feature scores are values which ... each of which expresses a range of possible strengths or states of a product feature ..." which is not found to be supported by the application as originally filed.
3. **Claim 1** comprises subject matter which does not comply with the requirement of Art. 6 PCT which states that the subject matter of a claim has to be clear. It is underlined that according to the requirements of the PCT a claim shall be clear from the wording of the claim alone.
- 3.1 A lack of clarity is found with respect to the definition of the decision aid as such in claim 1 and the definition of the feature "product-feature-score". Wordings like "for example" introduce ambiguity and are not considered to be of limiting effect on the scope of the claim.

Vertrag über die internationale Zusammenarbeit auf dem Gebiet des Patentwesens  
Patent Cooperation Treaty  
Traité de coopération en matière de brevets

PCT

Application No.:

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- 3.2 It would appear appropriate to reword claim 1 such that "a technically-implemented decision aid system" is defined which defines clearly its purpose, for example, "which aids a user to select between a plurality of generally suitable products which are offered to the user". However, it is still unclear what should be understood by the expressions "generally suitable" and "offered to the user" being technical features of said decision aid system.
- 3.3 Having regard to the feature "product-feature-score", its current definition is unclear and merely defines this feature based on the feature "strength" which is not defined in the claim; moreover, a lack of consistency arises having in mind the applicant's oral confirmation that a "product-feature-score" would be independent from a user. According to the current definition in claim 1, a "product-feature-score" is clearly dependent on the user; this is also defined on page 10, lines 15f., where the feature "strength" is defined; there is no other definition of the feature "strength" found in the application as filed which would allow for a different interpretation.
4. Claim 1, as presently formulated, is understood to define a decision aid system which aids a user to select between a plurality of products, each product being defined by product-feature-scores. The system is displaying to a user a ranked list of said products as a result whereby the ranking is based on a calculated overall score for each product, said score is determined from the product-feature-scores and user- importance-scores, each of which is entered by the user for each single product feature. In addition, the claimed decision aid system is said to simultaneously display the current set of user-importance-scores and at least a portion of said ranked list of products. The user interface is said to be illustrated in Figure 3.
- 4.1 The feature "simultaneously displaying" is taken in the general applicable sense which is that different pieces of information are displayed at the same time to a user.
- 4.2 Having regard to page 7, lines 12-17, of the description, it is acknowledged that the entering of new importance-scores by the user triggers a new calculation and ranking of products which are subsequently displayed to the user.
- 4.3 Having regard to page 15, lines 23ff., it is disclosed that the updating of said display is linked to the movement of a pointing device, i.e. detecting a movement of the pointing device would trigger some update of the display.
5. D1 defines a decision aid system which simultaneously displays different types of information to a user including values which have been set by him: the user assigns importance values to product features (Fig. 5 and 6), said product features (i.e. decision components) being selected from predetermined list for a set of prespecified products; in addition, the user assigns to each product feature a satisfaction value which expresses the expected satisfaction from said product (i.e. choice item) for said product feature, in other

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words, a numeric product feature score is given for each product feature. Based on the entered information by the user, among others, importance values (Fig. 5 and 6), a ranked list is being determined and displayed to the user (D1: see Figure 9; column 4, lines 50ff.).

- 5.1 Assuming that Figures 5-9 illustrate different display windows of the D1 system, it is noted that D1 remains silent about a possible simultaneous display of two of said windows, in particular of the ranked list (Figure 9) and the inputted user importance values (Fig. 5 and 6). The procedure of D1 illustrated in Figure 10 appears to be a sequential process only; however, technically speaking and with regard to Figure 2, it is evident that the functions are realised by submodules which can be activated by the GUI (i.e. user) independently. D1 states that an obtained ranking may not be accepted as final result due to incomplete or missing information on a user's choice (D1: column 4, line 60f.). Different rankings are mentioned which implies that support is given to a user who wants to go back to a previous step in order to modify his user-set values.
- 5.2 The technical problem to be overcome is to extend the D1 system with a user-friendly and efficient interface where the user is able to have at a given time complete information about his inputted importance values and the possible effect of this choice.
- 5.3 The problem is overcome by either allowing the display of several windows on the screen, in particular for displaying the ranked list of products and for inputting the importance values, or by integrating the input device and the display of the ranked list into one single window. Both techniques are understood to be within the knowledge about interface design of a skilled person in the art.
- 5.4 As a consequence claim 1 is not inventive of a combination of D1, starting from D1, with standard knowledge of the design of user interfaces in the sense of Art. 33(3) PCT.
- 5.5 Having regard to paragraph 4.2, it is noted for sake of completeness, that D3 (Figures 2 and 3) illustrates a combined interface of an input device (scrollbars) and a display of a list of results. D3 anticipates an interactive and simultaneous display.
- 5.6 Having regard to paragraph 4.3, such a feature is seen to a general standard of designing user interfaces where actions can be triggered as soon as the focus of attention (expressed by a pointing device) is changing. For reference, the applicant is referred to D5 (column 2, lines 42ff.). D5 anticipates also the display of different types of information (D5: abstract).
- 5.7 D1 is understood to anticipate the display of detailed information about a product. The applicant is referred to D1, column 5, lines 20ff. where a user may "seek additional information [about a product], thereby helping to increase the wisdom of his decisions". D4 also anticipates this feature (D4: page 97, second paragraph and Figure 8).

Vertrag über die internationale Zusammenarbeit auf dem Gebiet des Patentwesens  
Patent Cooperation Treaty  
Traité de coopération en matière de brevets

PCT

Application No.:

PCT/GB99/01031

- 6.1 D2 is concerned with information filtering where a feature vector is matched against a user interest vector and results are displayed in form of a ranked list (D2: Figure 3) which may be displayed in form of a portion of said ranked list (D2: page 7, lines 10-30). The user defines his interest (i.e. importance) for particular messages (i.e. products); this is shown in Figure 3 and explained on page 8, lines 16-29, where it is stated that the interest values can be fine grained (which are generally speaking values from an interval). The ranking is explained on page 9, lines 19-29, whereby the ranking each time interest values change (D2: page 15, lines 19ff.) as well as it can take other types of information into account (D2: page 14, lines 1-6).
- 6.2 Apparently, D2 does not disclose a simultaneous display of the input device combined with the ranked list. However, the D2 system is designed for granting an efficient interaction among a plurality of users over a network which connects the users and allows them to exchange messages (D2: page 14, lines 10ff.). In such a system it would be an obvious step to allow for a combined display of ranking and an input device for importance values.

26/06/2000

.....  
Date (day / month / year)

Glaser, N

.....  
Authorized officer of IPEA



Enclosure(s):

D5

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

**PCT/GB 99/01031**

International Application No.

21 APRIL 1999

International Filing Date

United Kingdom Patent Office  
PCT International Application

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference  
(if desired) (12 characters maximum)

XO42/P491

**Box No. I TITLE OF INVENTION**

Decision Aid

**Box No. II APPLICANT**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Cambridge Consultants Limited  
Science Park  
Milton Road  
Cambridge CB4 0DW  
United Kingdom

This person is also inventor.

Telephone No.  
00 44 1223 420024

Facsimile No.  
00 44 1223 423373

Teleprinter No.

State (that is, country) of nationality:

State (that is, country) of residence:  
GB

This person is applicant  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

**Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Martin; Sean Christopher  
20 Clare Street  
Cambridge CB4 3BY  
United Kingdom

This person is:

applicant only

applicant and inventor

inventor only (If this check-box is marked, do not fill in below)

State (that is, country) of nationality:  
GB

State (that is, country) of residence:  
GB

This person is applicant  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

Further applicants and/or (further) inventors are indicated on a continuation sheet.

**Box No. IV AGENT OR COMMON REPRESENTATIVE ADDRESS FOR CORRESPONDENCE**

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

agent

common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

Burwell; Jason Rowell  
Cambridge Consultants Ltd.  
Science Park  
Milton Road  
Cambridge CB4 0DW  
United Kingdom

Telephone No.  
00 44 1223 392415

Facsimile No.  
00 44 1223 423373

Teleprinter No.

Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

## Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

*If none of the following sub-boxes is used, this sheet should not be included in the request.*

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Sharp, David William Nathaniel  
58a Natal Road  
Cambridge CB1 3NY  
GB

This person is:

 applicant only applicant and inventor inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
GB

State (that is, country) of residence:  
GB

This person is applicant for the purposes of:  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

 applicant only applicant and inventor inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

 applicant only applicant and inventor inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

 applicant only applicant and inventor inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

Further applicants and/or (further) inventors are indicated on another continuation sheet.

**Box No. VI PRIORITY CLAIMS** Further priority claims are indicated in the Supplemental Box.

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: * regional Office	international application: receiving Office
item (1) (21.04.98) 21 April 1998	98303046.1		E P	
item (2)				
item (3)				

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

**Box No. VII INTERNATIONAL SEARCHING AUTHORITY**

Choice of International Searching Authority (ISA)  
(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / E P

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)      Number      Country (or regional Office)

**Box No. VIII CHECK LIST; LANGUAGE OF FILING**

This international application contains the following number of sheets:

request	:	4 /
description (excluding sequence listing part)	:	15 /
claims	:	3 /
abstract	:	1 /
drawings	:	3 /
sequence listing part of description	:	0

Total number of sheets : 26 /

This international application is accompanied by the item(s) marked below:

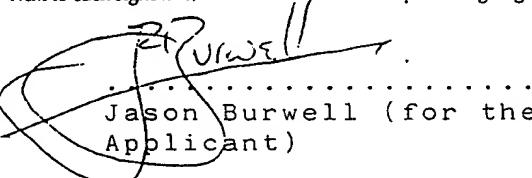
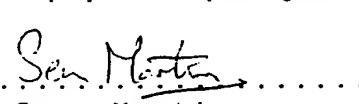
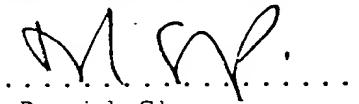
1.  fee calculation sheet
2.  separate signed power of attorney
3.  copy of general power of attorney; reference number, if any:
4.  statement explaining lack of signature
5.  priority document(s) identified in Box No. VI as item(s):
6.  translation of international application into (language):
7.  separate indications concerning deposited microorganism or other biological material
8.  nucleotide and/or amino acid sequence listing in computer readable form
9.  other (specify):

Figure of the drawings which should accompany the abstract: 2

Language of filing of the international application: English

**Box No. IX SIGNATURE OF APPLICANT OR AGENT**

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

 Jason Burwell (for the Applicant)		 Sean Martin (Inventor)		 David Sharp (Inventor)	
--------------------------------------------------------------------------------------------------------------------------	--	----------------------------------------------------------------------------------------------------------------	--	-----------------------------------------------------------------------------------------------------------------	--

**For receiving Office use only**

1. Date of actual receipt of the purported international application:	21 APRIL 1999	21.04.99	2. Drawings:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:			<input checked="" type="checkbox"/> received: <input type="checkbox"/> not received:
4. Date of timely receipt of the required corrections under PCT Article 11(2):			
5. International Searching Authority (if two or more are competent): ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.		

**For International Bureau use only**

Date of receipt of the record copy by the International Bureau:

## TENT COOPERATION TRE

PCT

**NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT**

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

BURWELL, Jason, Rowell  
 Cambridge Consultants Ltd.  
 Science Park  
 Milton Road  
 Cambridge CB4 0DW  
 ROYAUME-UNI

Date of mailing (day/month/year) 01 October 1999 (01.10.99)
----------------------------------------------------------------

Applicant's or agent's file reference X042/P491
----------------------------------------------------

International application No. PCT/GB99/01031
-------------------------------------------------

International publication date (day/month/year) Not yet published
----------------------------------------------------------------------

**IMPORTANT NOTIFICATION**

International filing date (day/month/year)  
21 April 1999 (21.04.99)

Priority date (day/month/year)  
21 April 1998 (21.04.98)

Applicant CAMBRIDGE CONSULTANTS LIMITED et al
--------------------------------------------------

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
21 April 1998 (21.04.98)	98303046.1	EP	27 Sept 1999 (27.09.99)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 740.14.35	Authorized officer  Ting Zhao  Telephone No. (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

NOTICE INFORMING THE APPLICANT OF THE  
COMMUNICATION OF THE INTERNATIONAL  
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

BURWELL, Jason, Rowell  
Cambridge Consultants Ltd.  
Science Park  
Milton Road  
Cambridge CB4 0DW  
ROYAUME-UNI

Date of mailing (day/month/year)  
28 October 1999 (28.10.99)

Applicant's or agent's file reference  
X042/P491

IMPORTANT NOTICE

International application No.  
PCT/GB99/01031

International filing date (day/month/year)  
21 April 1999 (21.04.99)

Priority date (day/month/year)  
21 April 1998 (21.04.98)

Applicant  
CAMBRIDGE CONSULTANTS LIMITED et al

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:  
EP,JP,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

GB

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 28 October 1999 (28.10.99) under No. WO 99/54836

**REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)**

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a **demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

**REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))**

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

J. Zahra

Facsimile No. (41-22) 740.14.35

Telephone No. (41-22) 338.83.38

## PATENT COOPERATION TREATY

PCT

INFORMATION CONCERNING ELECTED  
OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

From the INTERNATIONAL BUREAU

To:

BURWELL, Jason, Rowell  
 Cambridge Consultants Ltd.  
 Science Park  
 Milton Road  
 Cambridge CB4 0DW  
 ROYAUME-UNI

Date of mailing (day/month/year) 14 December 1999 (14.12.99)
-----------------------------------------------------------------

Applicant's or agent's file reference X042/P491	IMPORTANT INFORMATION	
International application No. PCT/GB99/01031	International filing date (day/month/year) 21 April 1999 (21.04.99)	Priority date (day/month/year) 21 April 1998 (21.04.98)
Applicant CAMBRIDGE CONSULTANTS LIMITED et al		

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

EP :AT,BE,CH,CY,DE,DK,ES,FI,FR,GB,GR,IE,IT,LU,MC,NL,PT,SE  
 National :JP,US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

National :GB

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.

The International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer:

Jean-Marc Vivet

Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

## **NOTIFICATION OF ELECTION**

(PCT Rule 61.2)

## From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C.20231  
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year)  
14 December 1999 (14.12.99)

<b>International application No.</b> PCT/GB99/01031	<b>Applicant's or agent's file reference</b> X042/P491
--------------------------------------------------------	-----------------------------------------------------------

<b>International filing date</b> (day/month/year) 21 April 1999 (21.04.99)	<b>Priority date</b> (day/month/year) 21 April 1998 (21.04.98)
-------------------------------------------------------------------------------	-------------------------------------------------------------------

**Applicant** MARTIN, Sean, Christopher et al

1. The designated Office is hereby notified of its election made:

in the demand filed with the International Preliminary Examining Authority on:

22 November 1999 (22.11.99)

in a notice effecting later election filed with the International Bureau on:

2. The election  was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<p><b>The International Bureau of WIPO</b>  <b>34, chemin des Colombettes</b>  <b>1211 Geneva 20, Switzerland</b></p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p><b>Authorized officer</b></p> <p><b>Jean-Marc Vivet</b></p> <p>Telephone No.: (41-22) 338.83.38</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------

## TENT COOPERATION TRE.

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

BURWELL, Jason, Rowell  
 Cambridge Consultants Ltd.  
 Science Park  
 Milton Road  
 Cambridge CB4 0DW  
 ROYAUME-UNI

Date of mailing (day/month/year) 05 January 2000 (05.01.00)
Applicant's or agent's file reference X042/P491
International application No. PCT/GB99/01031

**IMPORTANT NOTIFICATION**

International filing date (day/month/year)  
21 April 1999 (21.04.99)

1. The following indications appeared on record concerning:				
<input checked="" type="checkbox"/> the applicant <input checked="" type="checkbox"/> the inventor <input type="checkbox"/> the agent <input type="checkbox"/> the common representative				
Name and Address SHARP, David, William, Nathaniel 58a Natal Road Cambridge CB1 3NY United Kingdom	State of Nationality		State of Residence	
	GB		GB	
	Telephone No.			
	Facsimile No.			
	Teleprinter No.			
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:				
<input type="checkbox"/> the person <input type="checkbox"/> the name <input checked="" type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence				
Name and Address SHARP, David, William, Nathaniel 50 Sneath Avenue Golders Green London NW11 9AH United Kingdom	State of Nationality		State of Residence	
	GB		GB	
	Telephone No.			
	Facsimile No.			
	Teleprinter No.			
3. Further observations, if necessary:				
4. A copy of this notification has been sent to:				
<input checked="" type="checkbox"/> the receiving Office <input type="checkbox"/> the International Searching Authority <input checked="" type="checkbox"/> the International Preliminary Examining Authority		<input type="checkbox"/> the designated Offices concerned <input checked="" type="checkbox"/> the elected Offices concerned <input type="checkbox"/> other:		

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  Margret Fourne-Godbersen  Telephone No.: (41-22) 338.83.38
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